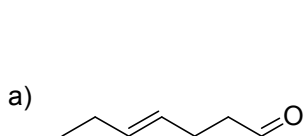


CHM 2120 – Assignment 7

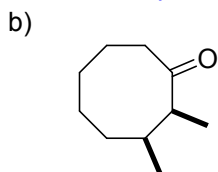
In this assignment:

- Oxidation of alcohols
- Nucleophilic addition to carbonyls
- Acetals and derivatives
- Wittig reaction
- Baeyer-Villiger reaction

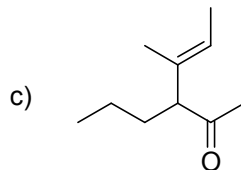
1. Provide names for the following compounds



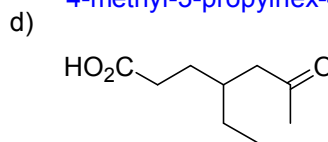
E-hept-4-enal



cis-2,3-dimethylcyclooctanone



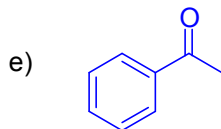
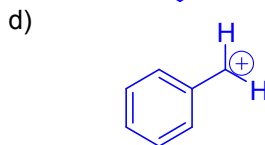
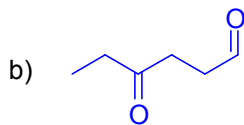
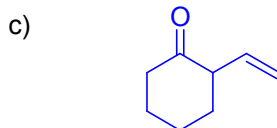
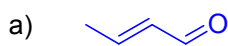
4-methyl-3-propylhex-4-en-2-one



4-ethyl-6-oxoheptanoic acid

2. Draw the structure corresponding to the following names:

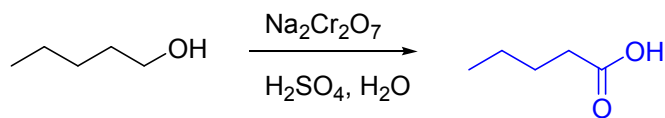
- (*E*)-2-butenal
- 2-ethenylcyclohexanone
- 4-oxohexanal
- the benzyl carbocation
- 1-phenylethanone (acetophenone)



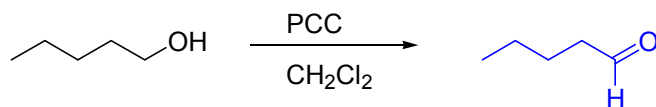
3.

- a. Give the product of the following reactions
 b. Explain, using a mechanism, why the product from parts i and ii are different

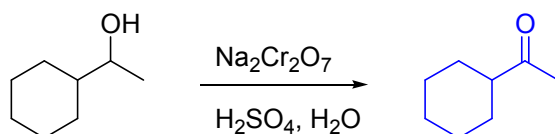
i.



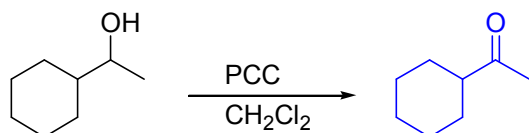
ii.



iii.

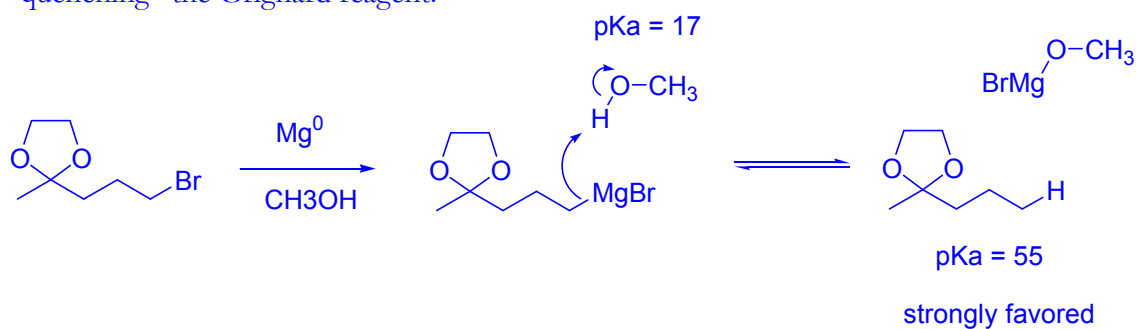


iv.

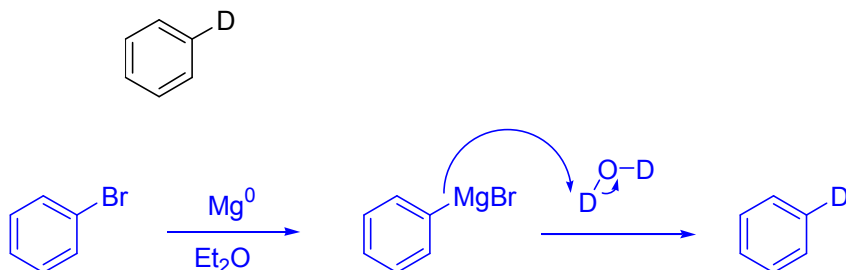


4. Can Grignard reactions be conducted in protic solvents? Explain.

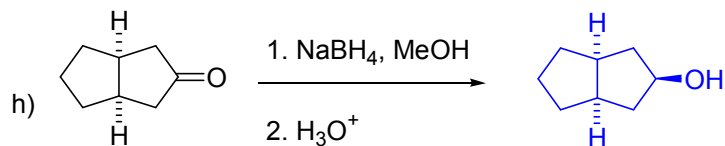
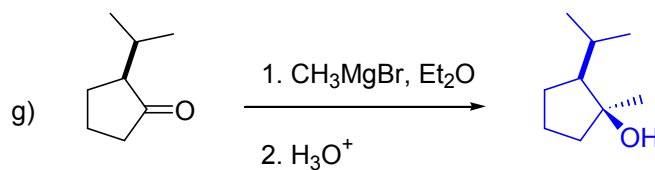
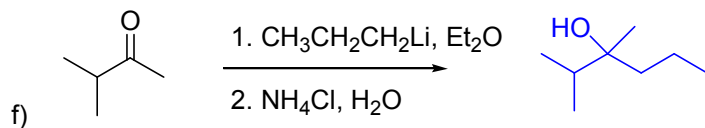
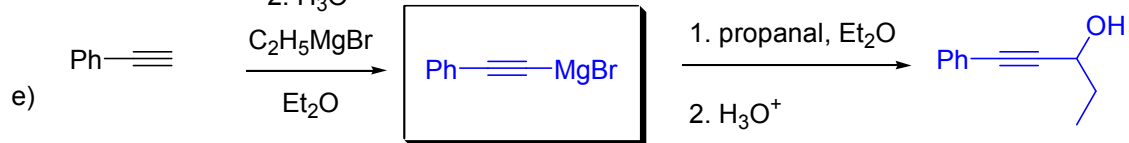
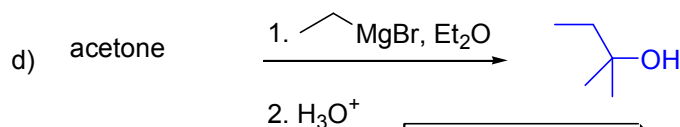
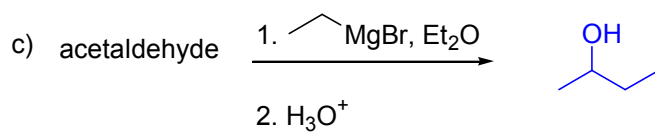
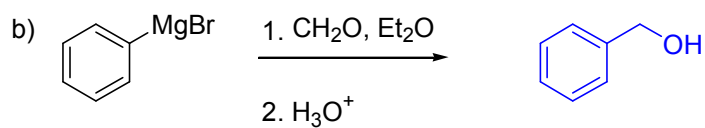
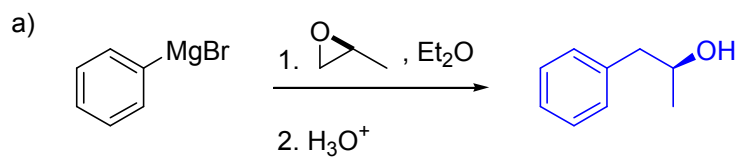
No. Grignard reagents are strong nucleophiles and strong bases. The pK_a 's of their corresponding conjugate acids are usually very high (>30). Protic solvents such as water and alcohols have pK_a s less than 20. Acid base chemistry will occur "quenching" the Grignard reagent.



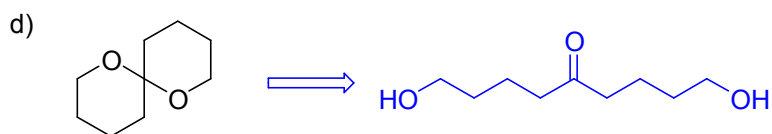
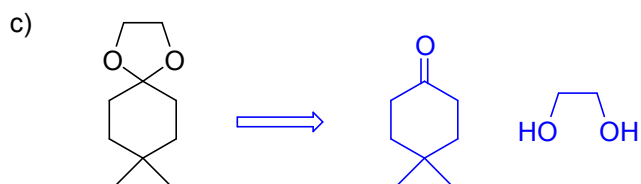
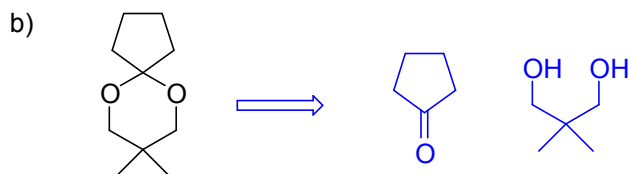
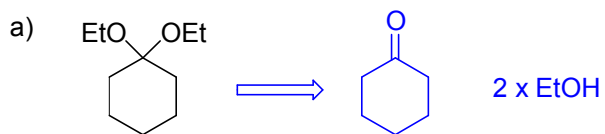
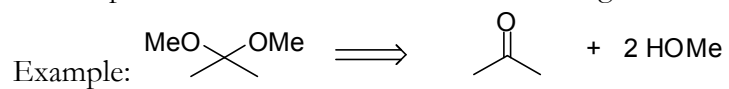
5. How could you synthesize the following deuterium-labeled compound from bromobenzene, magnesium, dry ether, and deuterium oxide?



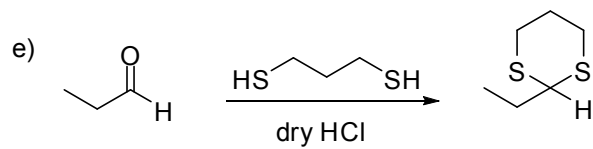
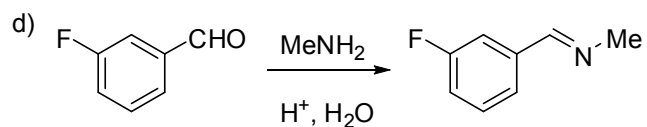
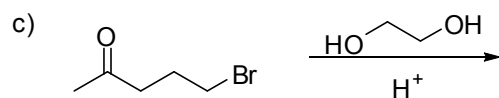
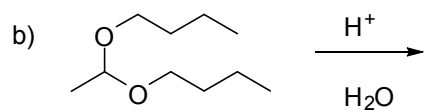
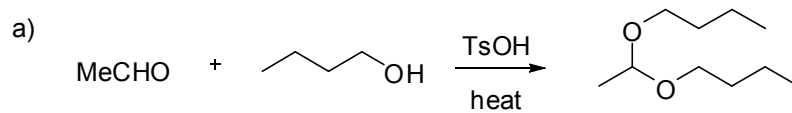
6. Give the products of the following reactions:



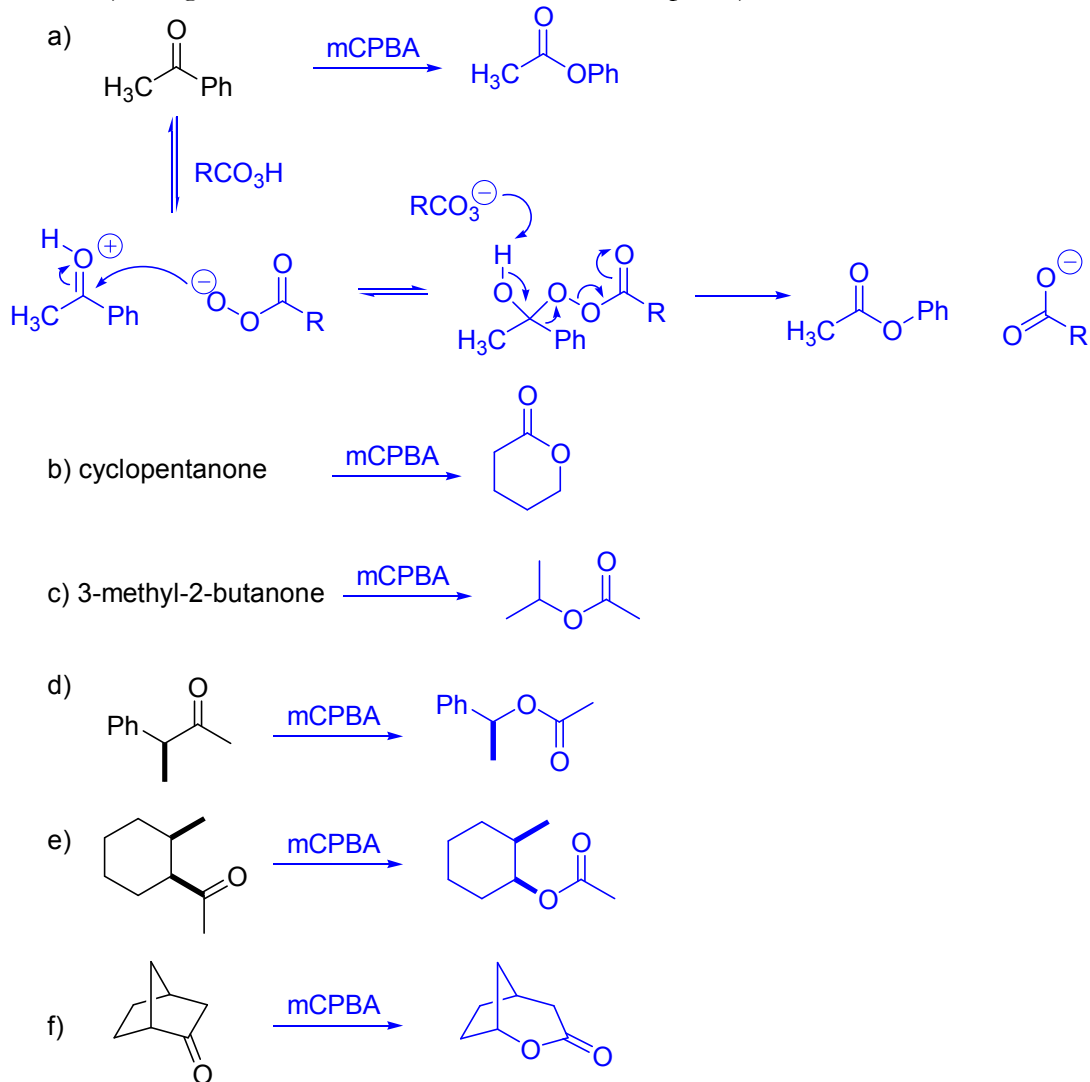
7. Which compounds were used to make the following acetals?



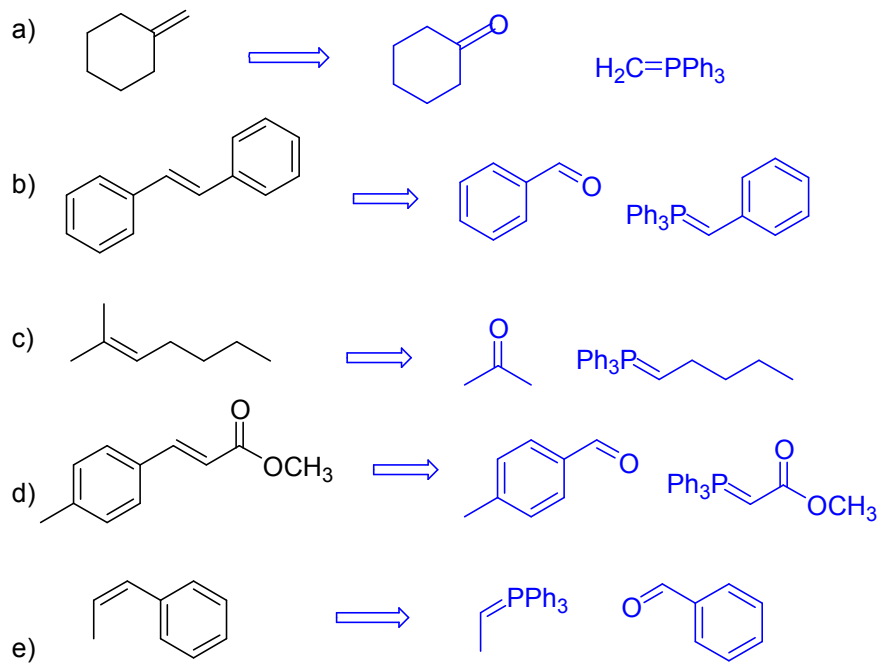
8. Draw a mechanism for the following transformations and name the key intermediates:



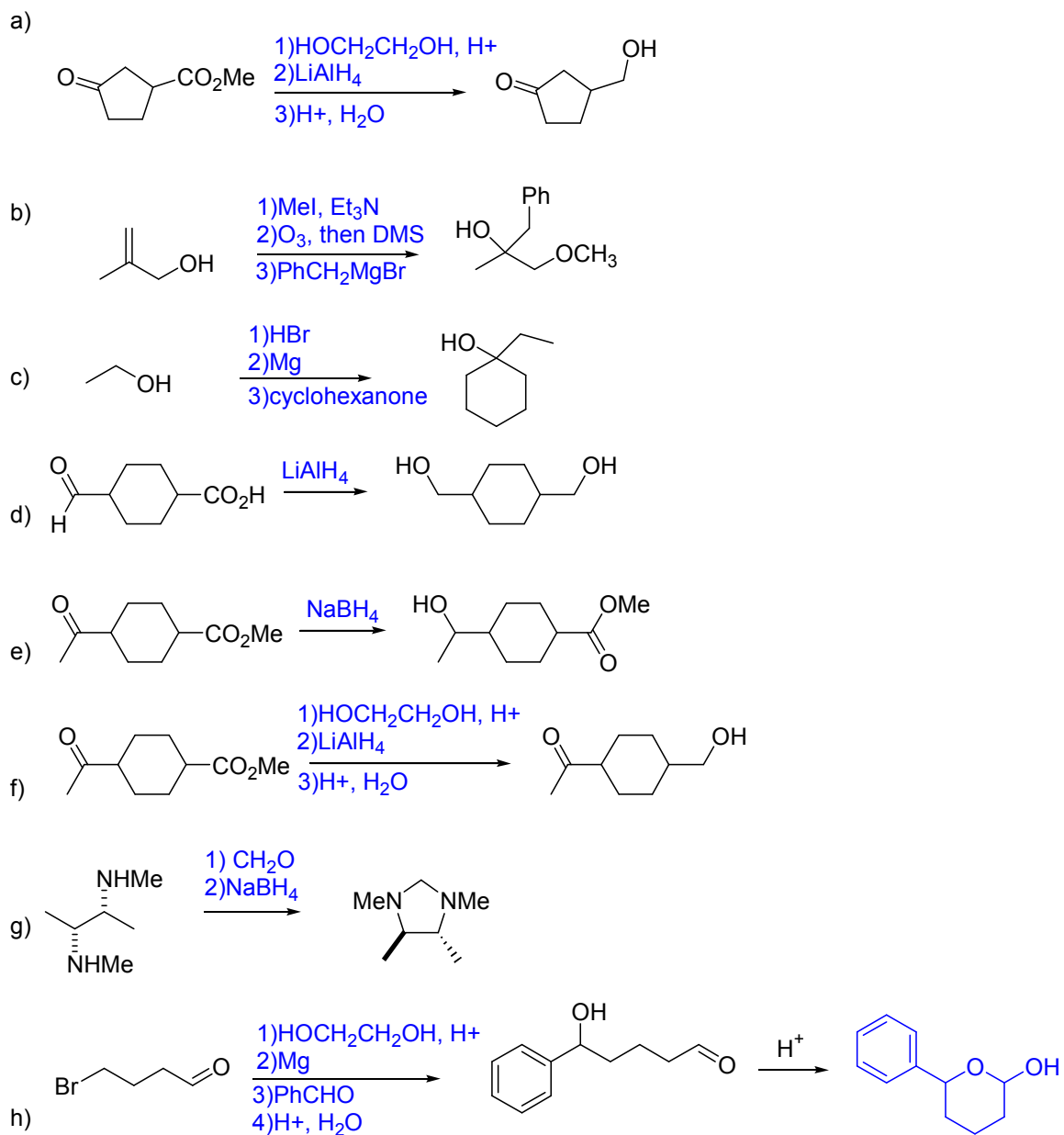
9. Give the product of the following process of the reactant shown with RCO_3H (i.e. MCPBA) and give the mechanism for the reaction in part a).



10. How would you synthesize each of the following alkenes using the Wittig reaction?

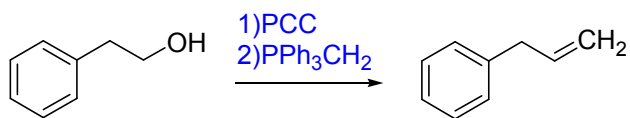


11. How could you accomplish the following transformations?

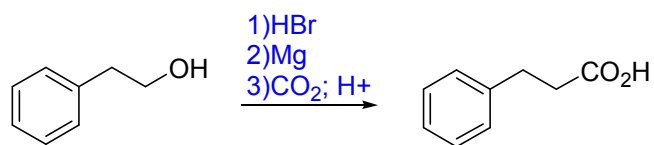


12. What reagents are required to carry out the following conversions? Multiple steps are required.

a.



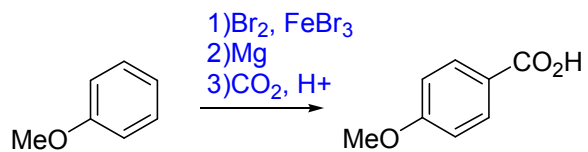
b.



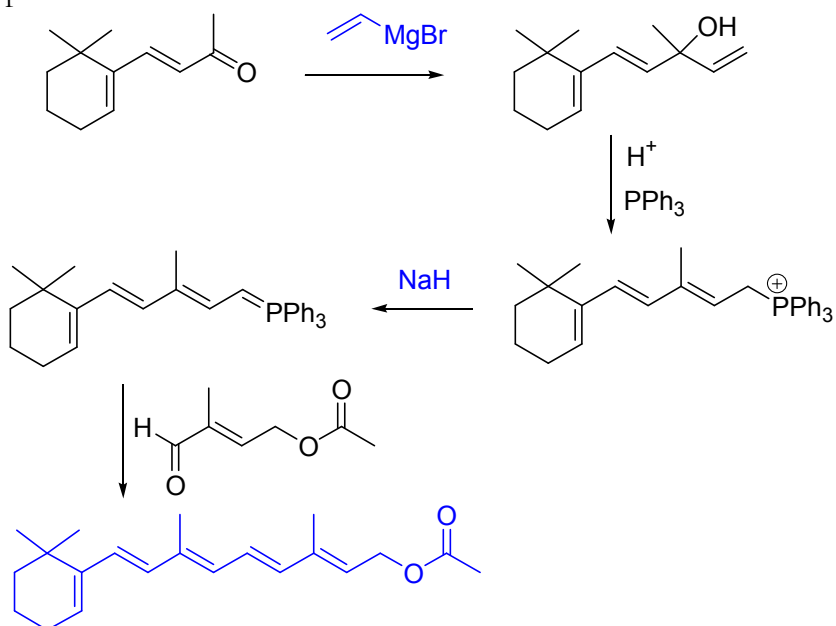
also possible

- 1) PCC
- 2) Ph_3PCH_2
- 3) BH_3 ; H_2O_2 , NaOH
- 4) $\text{Na}_2\text{Cr}_2\text{O}_7$, H_2SO_4

c.



13. How could you accomplish the following transformations? Draw a mechanism for each step:



14. Outline the synthesis of the following compounds from any alkene, alkyne, or aromatic starting materials possessing 6 carbons or less.

