

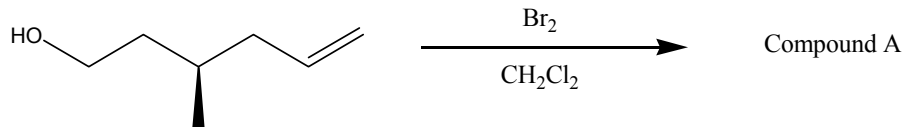
Organic Chemistry: CHEM 231B

Spring 2002 - Whittier College

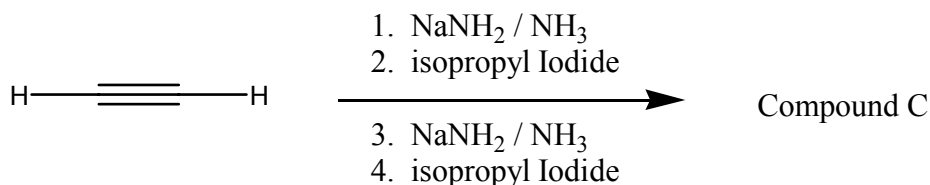
Problem Set #2

September 8, 2003

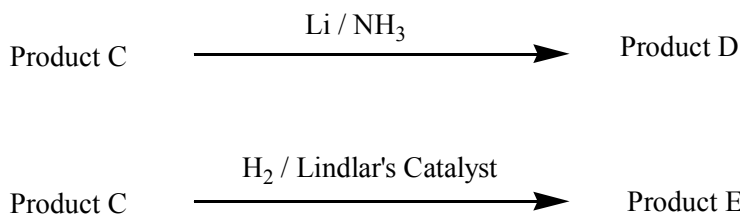
1. Consider the following reaction:



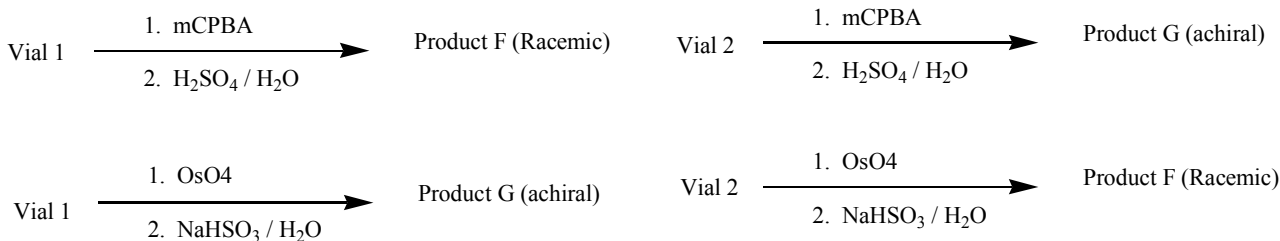
- 1a. What is the structure of compound A?
1b. Write a mechanism that accounts for the formation of compound A.
1c. If the solvent for the reaction is changed from dichloromethane to water, a new, minor product, Compound B, is formed. What is compound B? Why is it always a minor product?
1d. Write a mechanism for the formation of compound B.
1e. How would you use spectroscopy to differentiate between the two products?
2. Bob conducted the following four reactions on ethyne.



- 2a. What is compound C?
2b. Bob started the following two reactions in his laboratory.

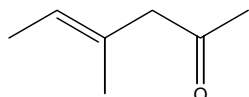


However, since Bob is a little disorganized, he mistakenly confused the identity of each reaction. Instead of asking for help he just continued on with the following reactions. Please help Bob identify which reaction vial came from which product. Also, identify all products.

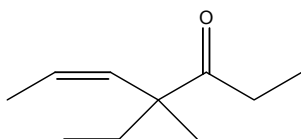


3. Do Chapter 13, question number 43 from your book.

4. Conduct a retrosynthetic analysis for the two problems below. Investigate more than one method to make the desired molecules; the various methods do not have to be completely correct (they need to be real reactions but do not have to go all the way to the desired starting material), but rather should show that you have thought of alternative routes. Choosing the best route, show the synthetic scheme you would use to make the desired molecules.

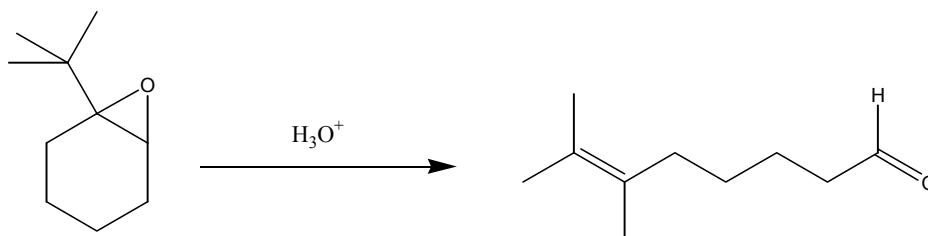


From any compound with three carbons or less



From any compound with three carbons or less

5. Write a mechanism that accounts for the formation the product from the following reaction.



6. Compound H, C_6H_{10} , reacts with hydrogen gas in the presence of palladium in ethanol to consume 1 equivalent of H_2 and forms methylcyclopentane, compound I. Compound H reacts with one equivalent of bromine in carbon tetrachloride to yield two isomeric products, Compounds J & K, that have different NMR spectra and can be separated using column Chromatography. Compound H upon treatment with ozone followed by zinc in acetic acid yields one compound, Compound L, which has two characteristic absorbances in the IR at 1725 & 1732. What are the structures for each of the products, H through L.