

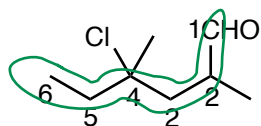
Problem Set Chapter 20

Organic Chemistry for
Life Sciences: CHM 224

Name _____

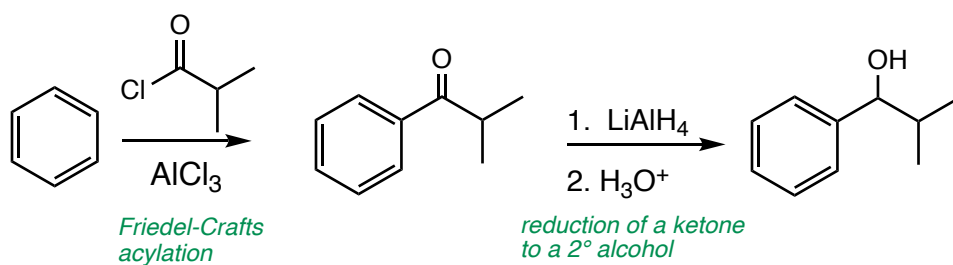
DUE: Monday, March 16 @ 8am

1. Provide the IUPAC name for the following compound:

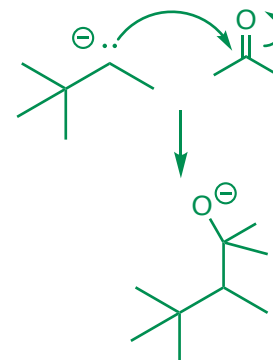
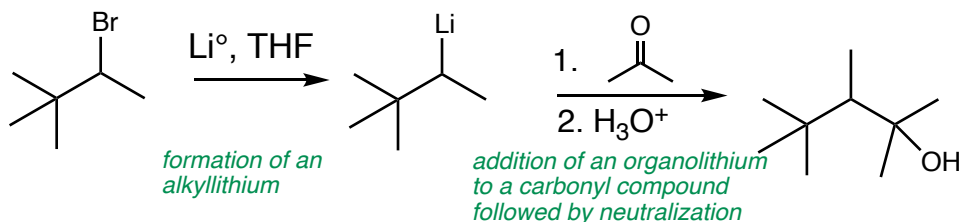


4-chloro-2,4-dimethylhexanal

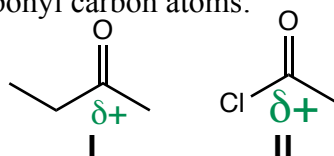
2. Provide the missing compound structures for the following sequence:



3. Provide the missing compound structures for the following sequence:

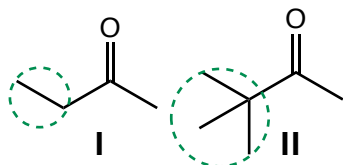


4. Based on what we learned about the relative reactivity of aldehydes and ketones, which compound below (**I** or **II**) would you expect to be more reactive with nucleophiles? Briefly explain based on partial positive charges on the carbonyl carbon atoms:



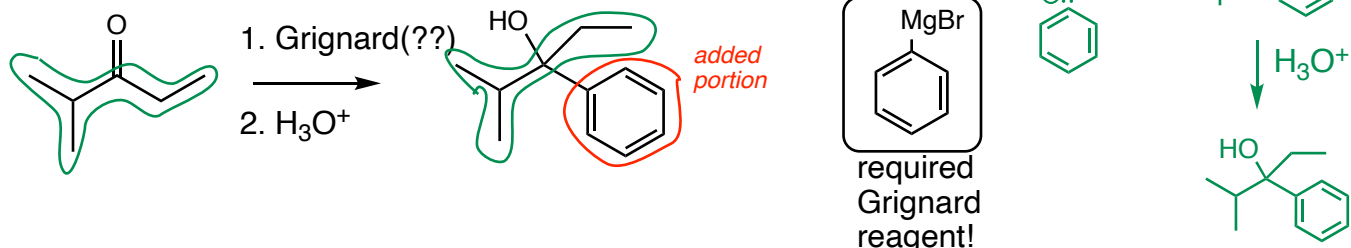
- Compound I differs from compound II by the nature of the substituent on the left side of the carbonyl group
- The Cl group is an electron-withdrawing group while the ethyl (R) group is electron donating
- The electron-withdrawing group will place a larger δ^+ onto the carbonyl carbon relative to an electron-donating group
- Thus, compound II will be MORE reactive towards nucleophiles than compound I because of the greater attraction of the nucleophile to the larger δ^+

5. Based on what we learned about the relative reactivity of aldehydes and ketones, which compound below (**I** or **II**) would you expect to be more reactive with nucleophiles? Briefly explain:

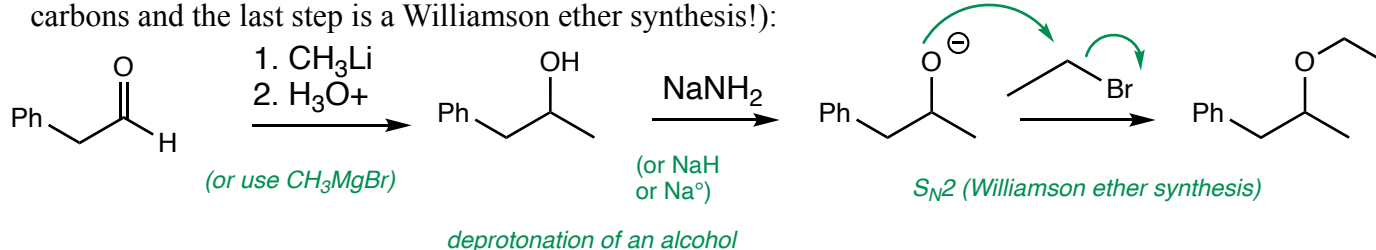


- Compound I differs from compound II by the nature of the substituent on the left side of the carbonyl group
- The tert-butyl group is a much larger alkyl group than the ethyl group
- The larger group will introduce more steric hindrance towards nucleophilic attack at the carbonyl carbon.
- Therefore, compound I will be more reactive towards nucleophiles than compound II

6. What Grignard reagent is necessary to complete the following reaction?



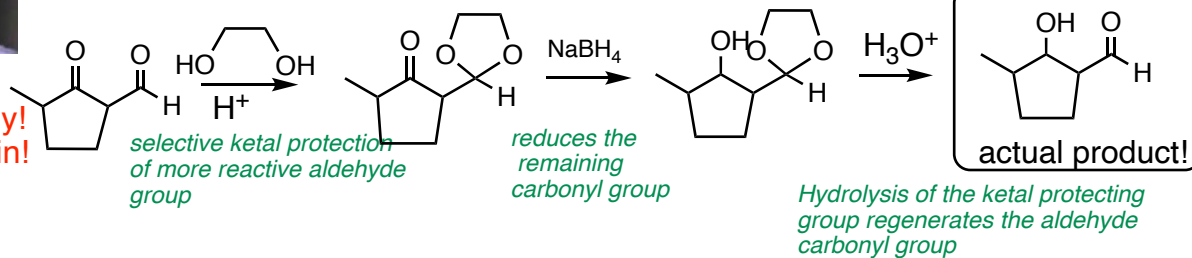
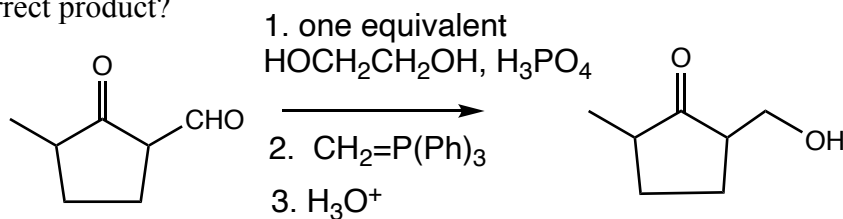
7. Provide the reagents necessary to complete the following sequence (HINT: look carefully at numbers of carbons and the last step is a Williamson ether synthesis!):



8. Jimmy predicts the product of the following reaction sequence to be as indicated. Is Jimmy correct? If not, what IS the correct product?



Jimmy
Sorry Jimmy!
Wrong again!



9. What compound is required to complete the following reaction?

