

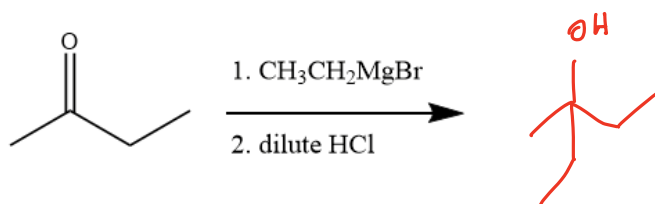
CHEM 223 (2024) SI Session #20

Learning Objectives: By the end of this session, students should be able to:

- Synthesize alcohol products
- Synthesize alcohol derivatives

Section 1: Carbonyls to Alcohols

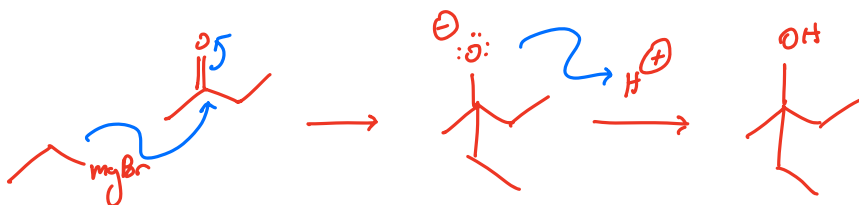
1. For the reaction below,



a. Predict the product

above

b. Draw a mechanism for the reaction. Explain which atom is nucleophilic and why



The C-Mg bond is nucleophilic, as C is more electronegative than Mg.
C acts like a carbanion

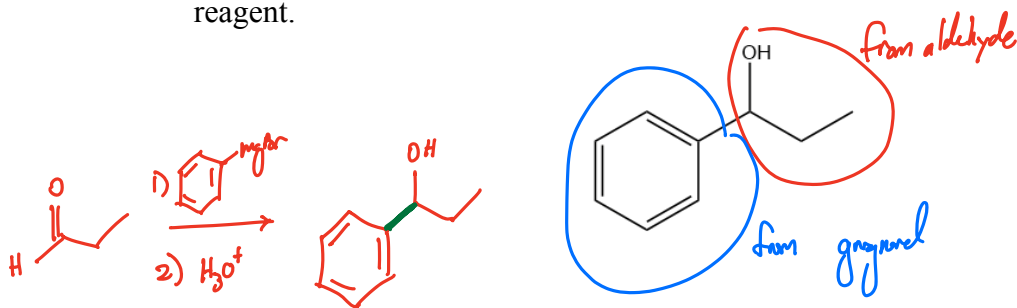
2. If the reaction in #1 is done in water or ethanol, will the reaction proceed? Explain.

No; water & acid must be added in a separate step (hence the 1. and 2.)

3. Synthesize the reagent in #1, starting from ethylbenzene.
bromine

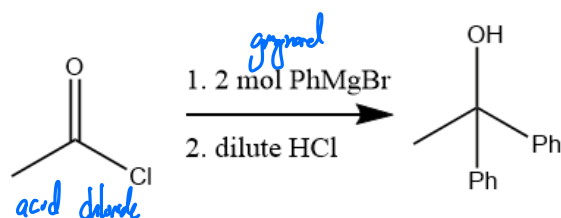


4. Synthesize the following product, using an appropriate carbonyl and organometallic reagent.



Section 2: Other Organometallic Reactions

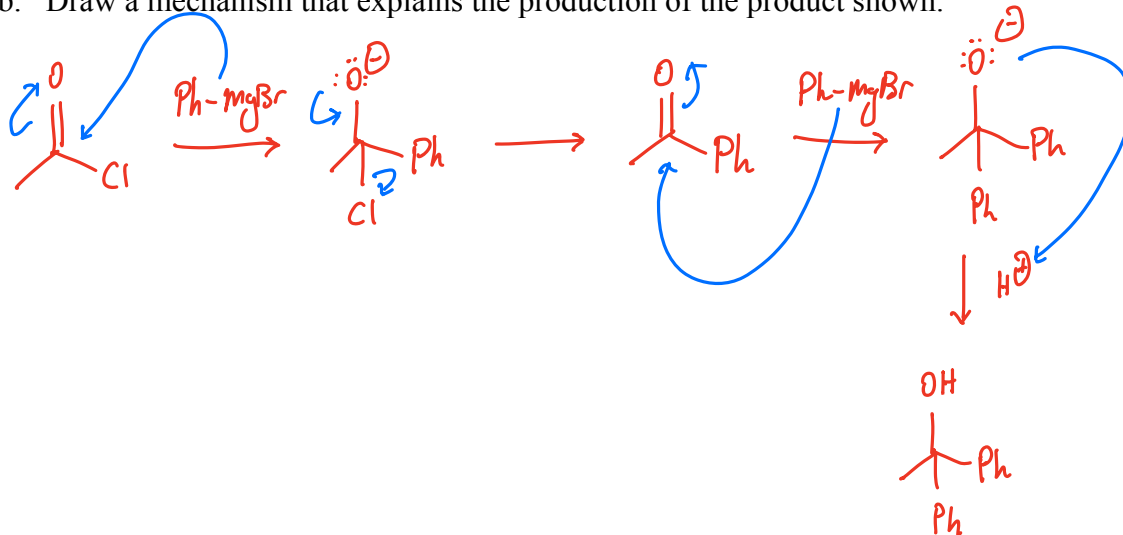
5. Using the reaction below,



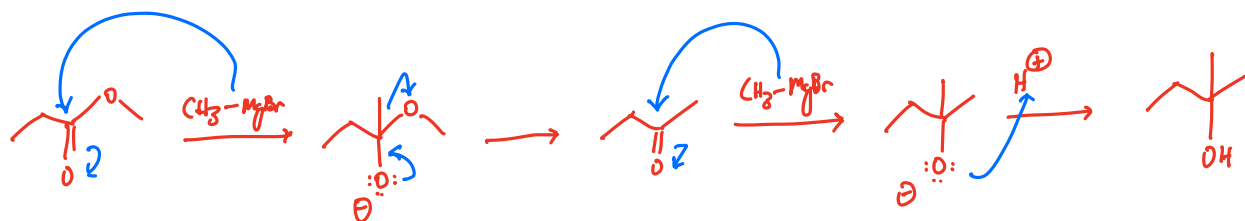
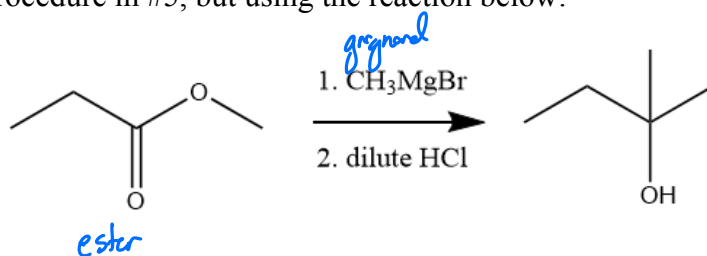
- a. Name each species in the reaction (not IUPAC, just a general name).

above

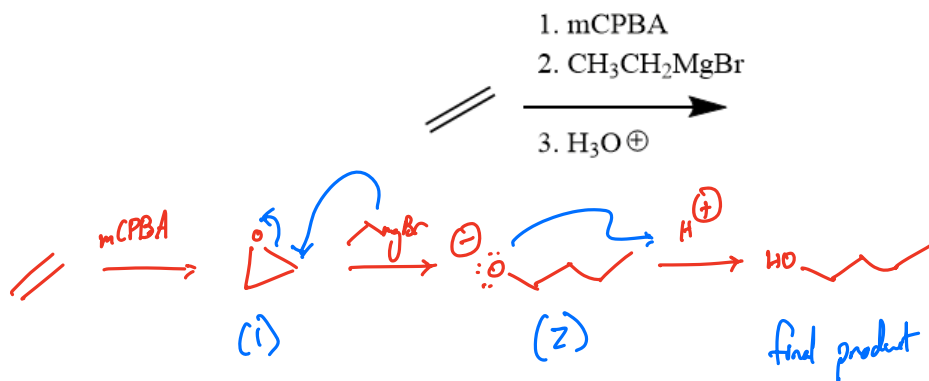
- b. Draw a mechanism that explains the production of the product shown.



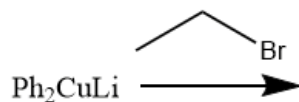
6. Repeat the procedure in #5, but using the reaction below:



7. For the stepwise reaction below, provide the intermediates of each step



8. For the reaction below,



a. Provide a name for the organometallic used here

lithium dialkylcuprate; Gilman reagent

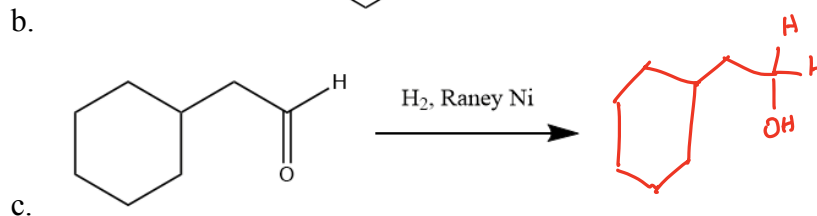
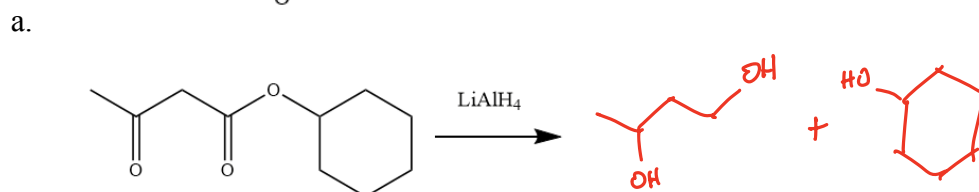
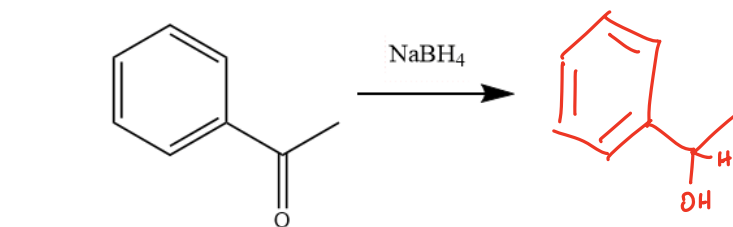
- b. Provide a product for the reaction. Can this reaction occur with the other organometallics? Explain your answer.

Replace Br w/ Ph (S_N2 -like); does not work w/ Grignards, as Grignards are too strongly basic.



Section 3: Reduction

9. For each of the reactions below, provide the products.



10. The reaction in #9c is not commonly used - explain why.

Raney Ni can reduce carbon-carbon double & triple bonds.