

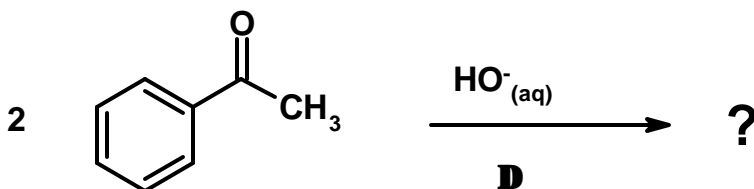
Chemistry and Biochemistry
School of Physical Sciences

59-331/333
Test #1

Feb. 16, 2001
Time: 50 minutes

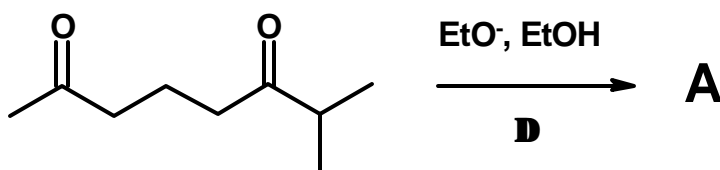
Answer all questions in the test booklet(s) provided. Answers written in pencil will be marked, but cannot be returned for remarking.

1. Give the **complete** mechanism for the base (OH^-) catalyzed aldol reaction between two molecules of acetophenone. Please show **all** steps and **all** intermediates, and all small molecules given off or used during the reaction. Please also indicate which steps are reversible and which are (essentially) irreversible. (10 marks)

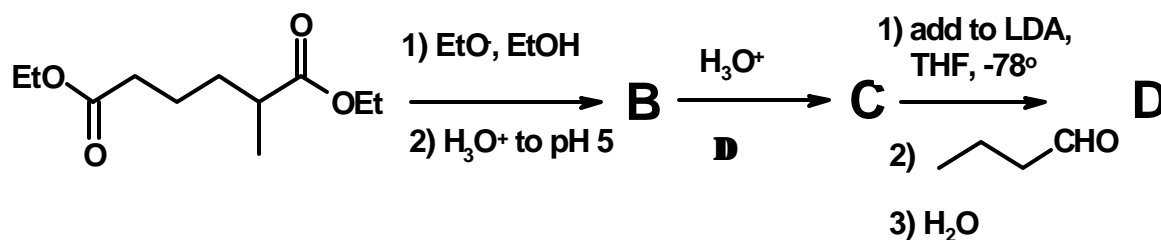


2. Indicate the structure of the expected major product from each of the following reactions. Include stereochemistry where it is relevant. Mechanisms are *not* necessary, but showing your work is likely to be a help. (5 for each letter, 40 marks total)

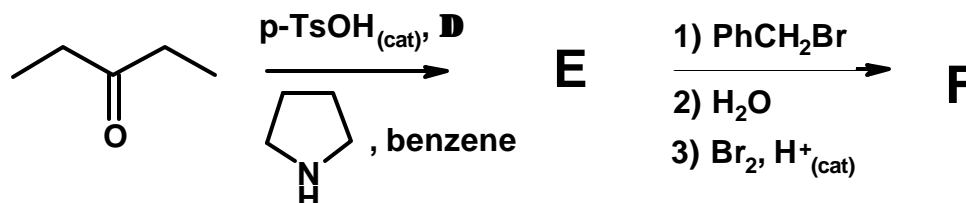
a)



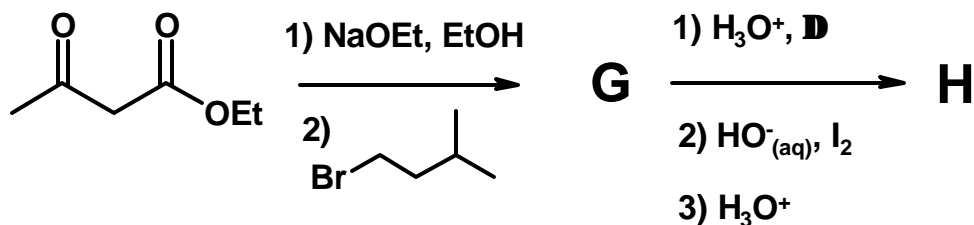
b)



c)

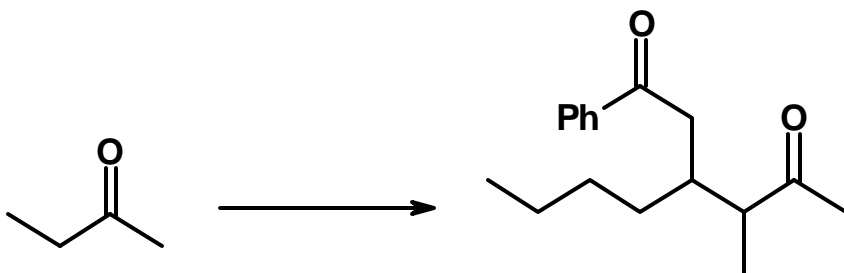


d)

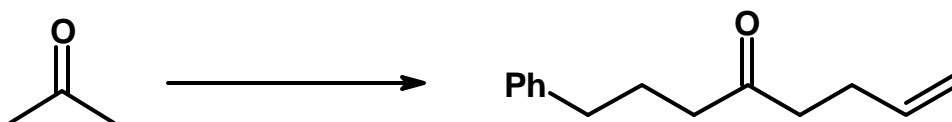


3. Show by equation how you would prepare the products illustrated below from the indicated starting material. You may use *any* other reagents you deem to be fit. Show all reagents, conditions, and *intermediates that could be isolated*. Mechanisms are not necessary, but showing your work may be a help. (10 marks each, 30 total)

a)

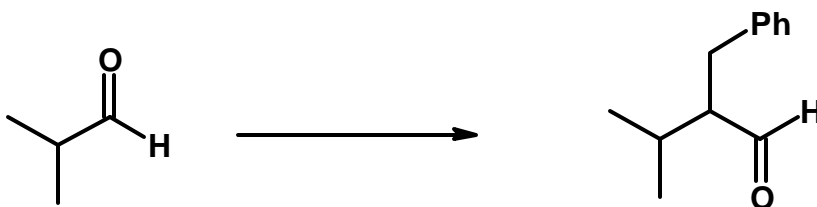


b)



Assume polyalkylation is a problem with simple ketone alkylation

c)



Bonus The following rearrangement is often observed during the treatment of α -chloroketones with alkoxide based. This is really an example of (what would normally be) the minor processes taking over in certain situations. Propose a reasonable mechanism for this reaction.

