

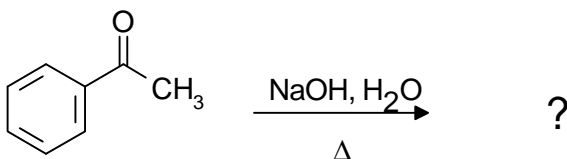
UNIVERSITY OF WINDSOR
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY

Chemistry 59-331/333 Feb. 7, 1996

First Test Time: 50 minutes

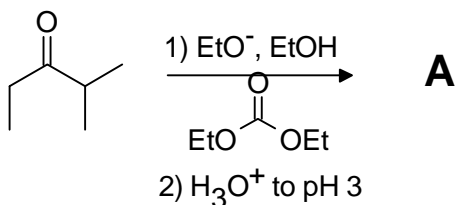
Answer all questions in the exam booklet

1. Give the complete mechanism for the aldol condensation between two molecules of acetophenone. Please show which steps are reversible and which are irreversible. Show also any small molecules which are evolved during the reaction. **(10 marks)**

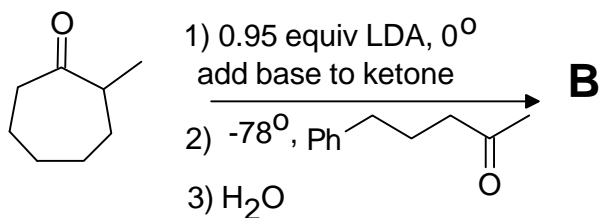


2. Indicate the structure of the expected major product from each of the following reactions. Include stereochemistry where relevant. Mechanisms are not necessary, but showing your work is likely to be a help. **(40 marks)**

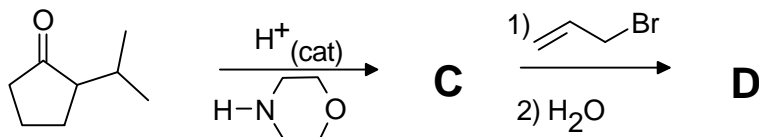
a)



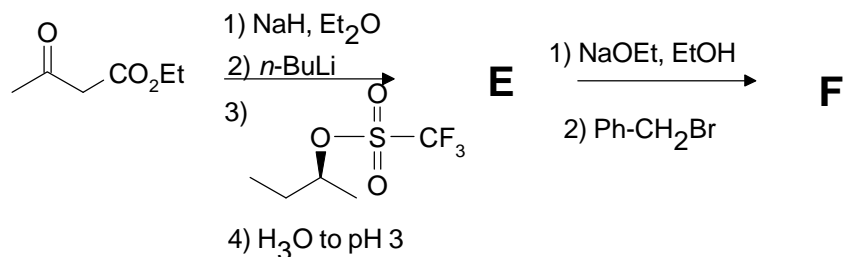
b)



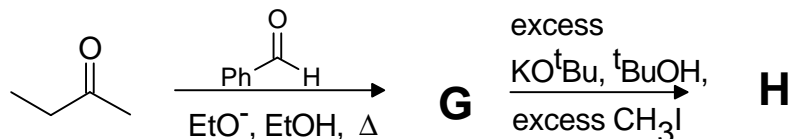
c)



d)

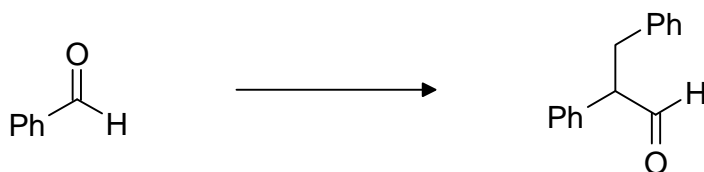


e)

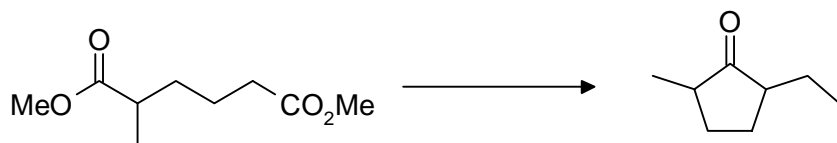


3. Show by equation how you could prepare the products illustrated below from the given starting material. You may use any other reagents you deem fit. Show all reagents, conditions, and intermediates which could be isolated. Mechanisms are not necessary, but may be a help. **(Total 30 marks)**

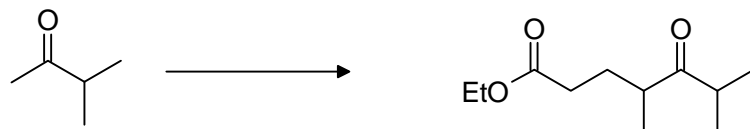
a)



b)



c)



Bonus:

Relief of strain can cause reactions which will not normally occur to occur under reasonable conditions (i.e., turn a normally poor leaving group into a good one). Given that this is a hint for the following, predict the course of the following reaction. Include a reasonable mechanistic (arrow pushing) rationale for the reaction (**up to 5 marks**).

