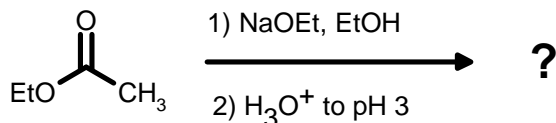


UNIVERSITY OF WINDSOR
SCHOOL OF PHYSICAL SCIENCE-CHEMISTRY AND BIOCHEMISTRY

59-331/333
First Test

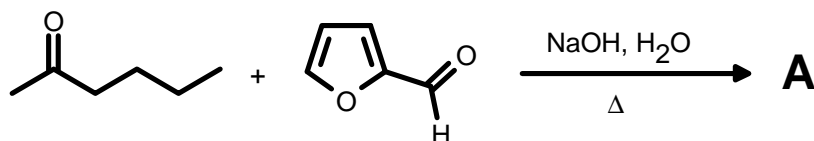
Feb. 6, 1998
Time: 50 minutes

1. Give the complete mechanism for the Claisen condensation between two molecules of ethyl acetate. Please show which steps are reversible, how the reaction is driven to completion, any any small molecules which are evolved during the reaction. (10 marks)

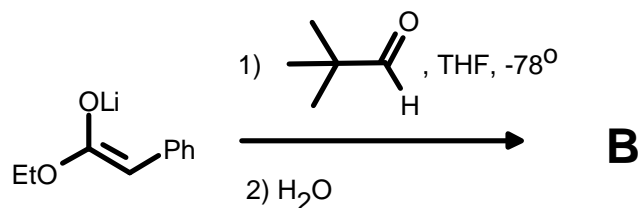


2. Indicate the structure of the expected major product from each of the following reactions. Include stereochemistry where it is relevant. Mechanisms are *not* necessary, but showing your work is likely to be a help. (5 for each letter, 40 marks total)

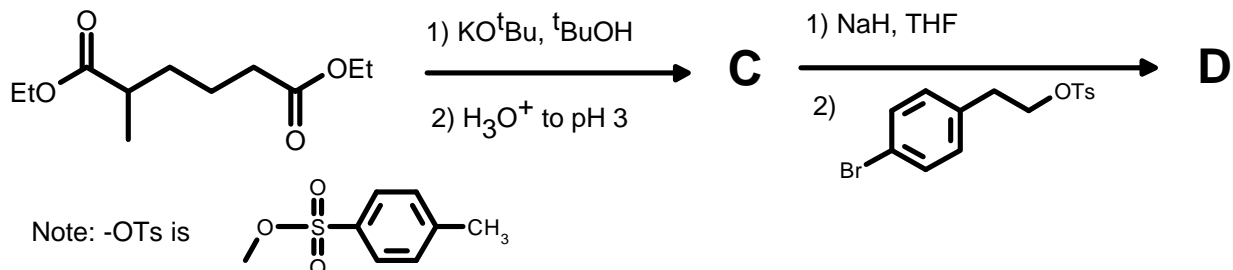
a)



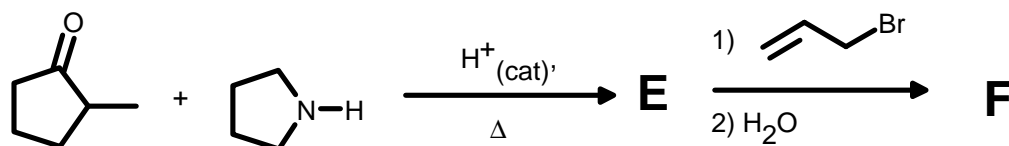
b)



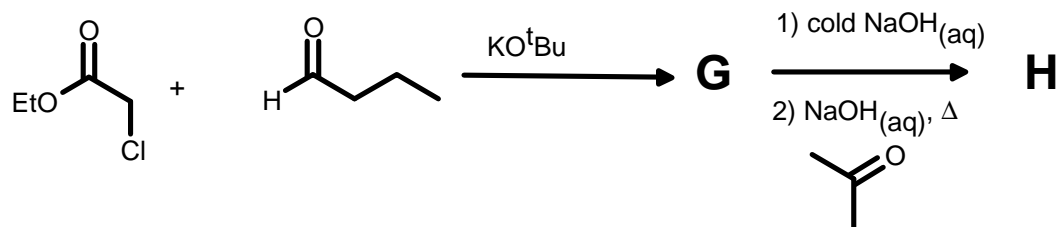
c)



d)

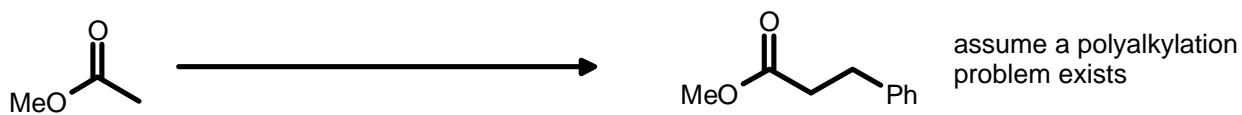


e)

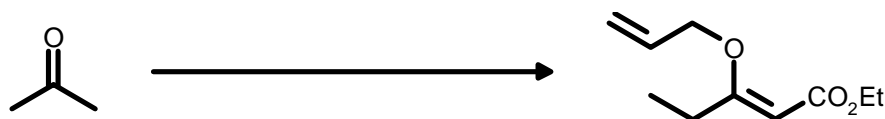


3. Show by equation how you could prepare the products illustrated below for the given starting material. You may use *any* other reagents that you deem fit. Show all reagents, conditions, and *intermediates which could be isolated*. Mechanisms are not necessary, but may be a help. (10 marks each, 30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

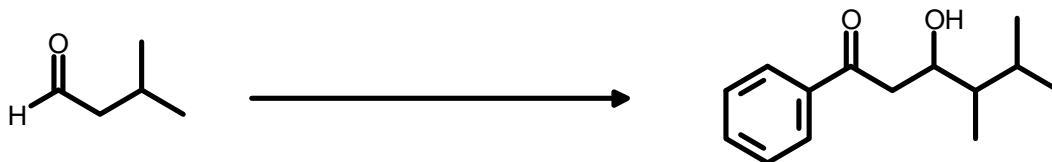
a)



b)



c)



Bonus: When some aldehydes, especially aromatic ones, are treated with cyanide ion, a reaction called a benzoin condensation occurs (shown below). Speculate on the mechanism of this condensation (Hint: the cyanide is the critical reagent here, and may serve in >1 capacity).

