

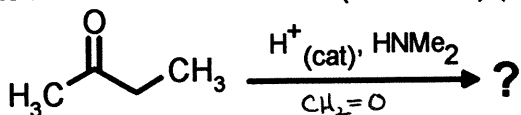
University of Windsor  
Department of Chemistry and Biochemistry

Chemistry 59-331/333  
Second Test

Mar. 7, 1997  
Time: 50 minutes

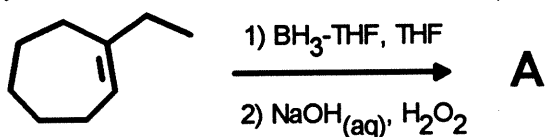
Answer all questions in the exam booklet

1. Show the mechanism of the Mannich reaction of ketones (using 2-butanone as a model). The full answer does not require the individual steps which convert the ketone to its more reactive isomer (tautomer) (10 marks).

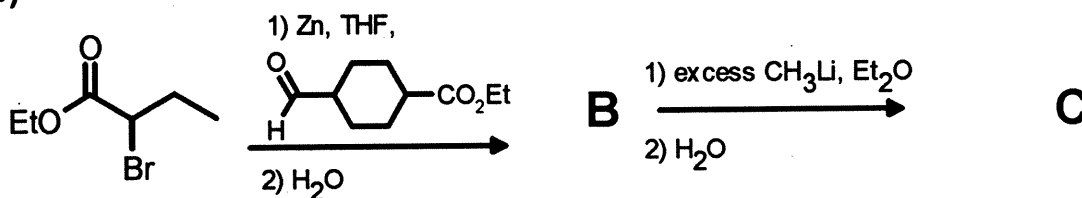


2. Indicate the structure of the major product from each of the following reactions. Include stereochemistry where relevant. Mechanisms are not necessary, but showing your work may be a help (5 marks for each letter, 40 marks total).

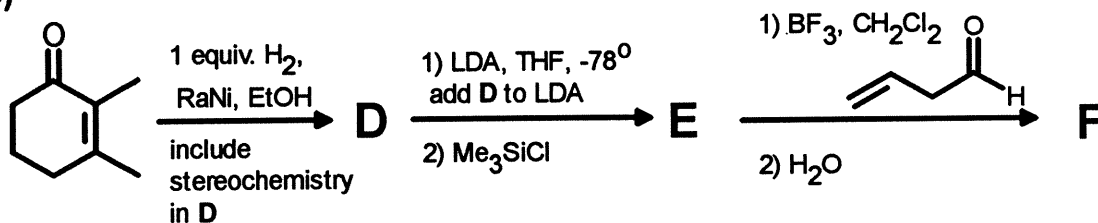
a)



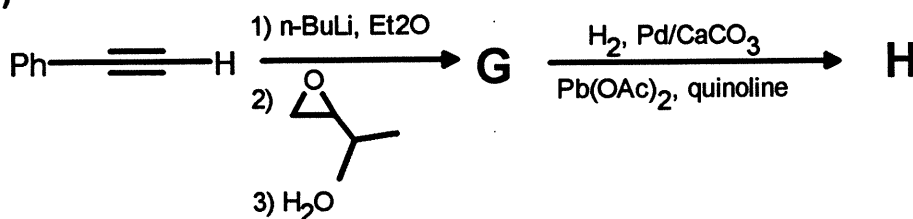
b)



c)

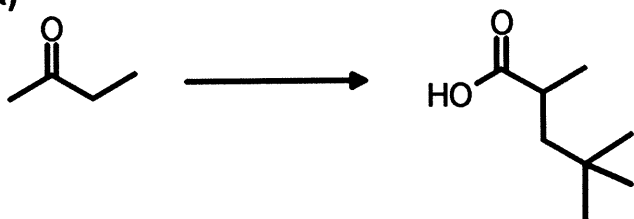


d)



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

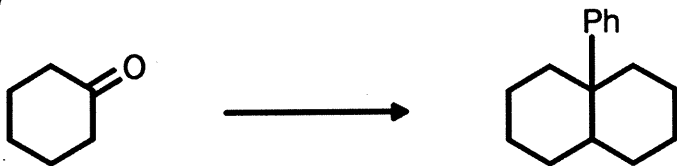
a)



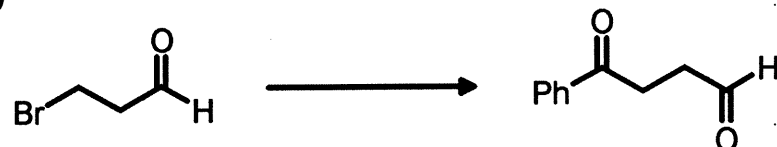
b)



c)



d)



**Bonus:** Professor Franklin Davis' research group has developed a now popular reaction of ketones with base and a phenylsulphonyloxaziridine (you'll see it below). Based on analogy to some of the chemistry you've learned in this course, predict what you get (worth a bit) and how you got it (worth more). The most striking characteristic of the product of interest is a broad infrared band centred at  $3400\text{ cm}^{-1}$ , in addition to a sharp one at  $1710\text{ cm}^{-1}$ .

