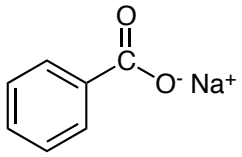
Long Island University, Department of Chemistry

Chem. 122, Sect 012, Exam 3, 100 pts, Spring, 2011

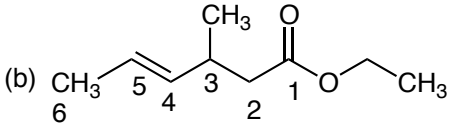
1. Name the following compounds. (10 pts)

(a)



sodium benzoate

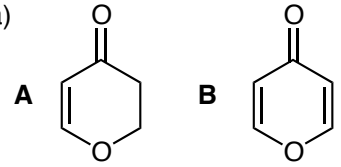
(b)



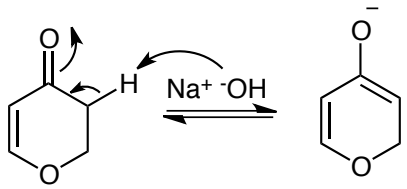
ethyl 3-methyl-4-hexenoate

2. (a) Look at molecules **A** and B. Which compound would form the greater concentration of enolate in basic conditions? Briefly explain your choice and show the complete reaction mechanism for enolate formation for the molecule you choose. (b) Look at molecules **C** and **D.** Which molecule would be more reactive to basic hydrolysis? Explain briefly and show the reaction that occurs for the molecule you choose, including the complete reaction mechanism. (20 pts)

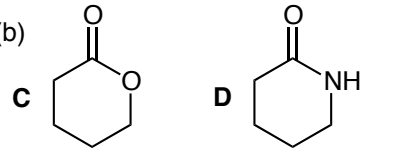
(a)



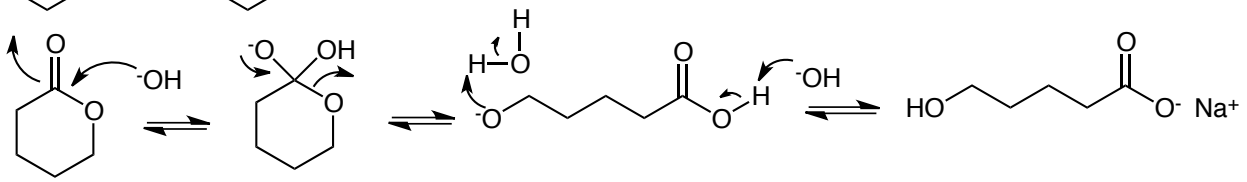
A will form the greater concentration of enolate in basic conditions. **B** can not enolize, since it would create an sp carbon.



(b)

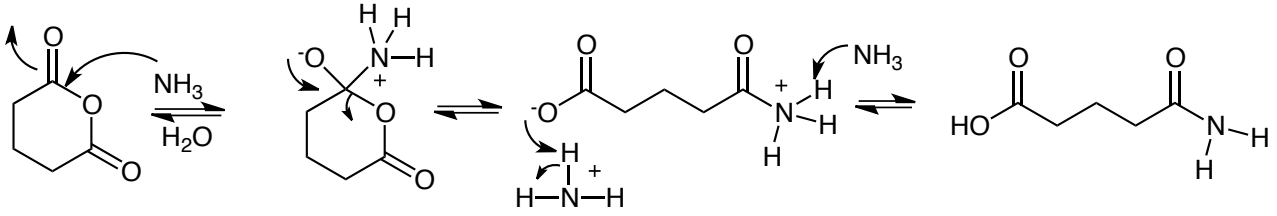


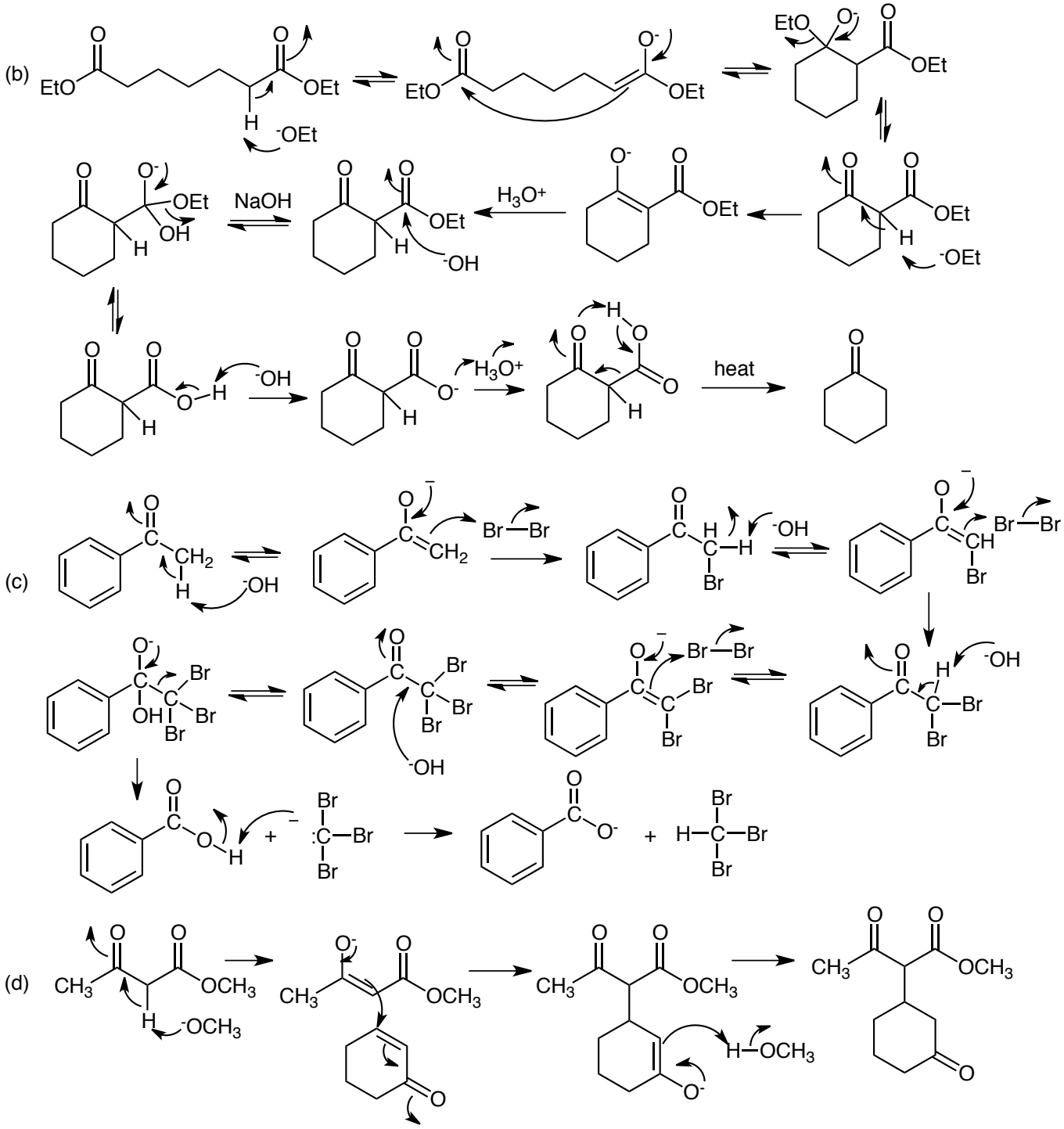
C will hydrolzye faster than **D**. The nitrogen lone pair in **D** is much better at donating electrons to the carboyl than the oxygen of the ester **C**, making the carbonyl carbln less electron defiecient and less reactive to nucleophilic attack by the hydroxide anion.



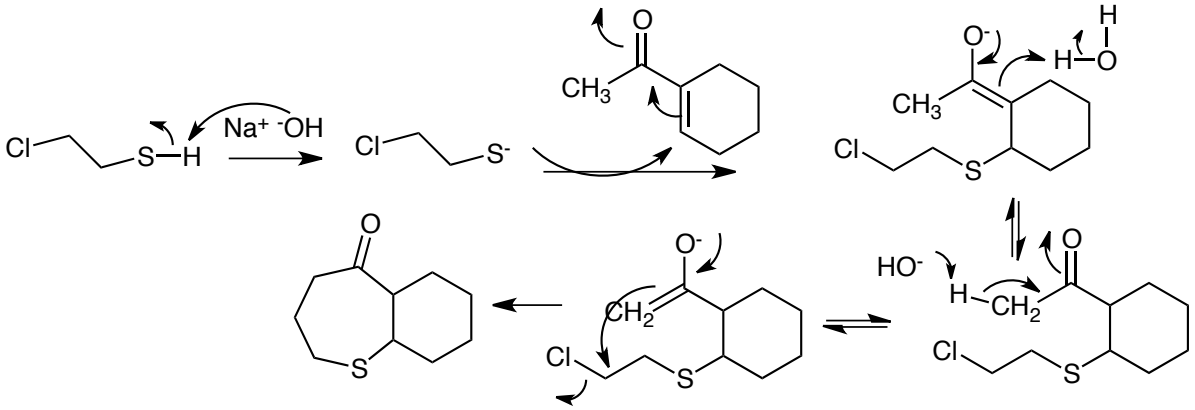
4. Give the product of the following reactions and in each case show the complete reaction mechanism by which it is formed. (40 pts)

(a)





5. Show how the following reaction occurs, giving all steps of the mechanism. No other reagents are needed except those given. (10 pts)



6. Synthesize **TWO** of the molecules shown on the right from the starting materials given on the left. Do all three for extra credit. (20 pts).