CHEM 330

Midterm Exam
October 24, 2007

Your name: ANSWERS

This a closed-notes, closed-book exam

The use of molecular models is allowed

Time: 50 min

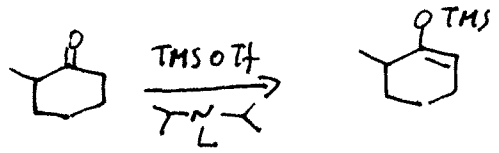
this document contains 5 pages

1.	_____	/ 12
2.	_____	/ 12
3.	_____	/ 28
4.	_____	/ 24
5.	_____	/ 24
TOTAL	_____	/100

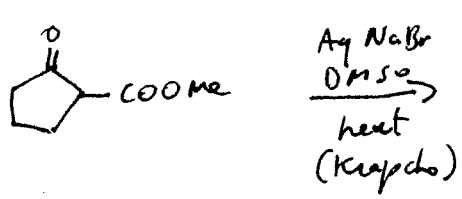
This exam counts for 25% of your CHEM 330 final grade

1. (12 pts) Write a chemical equation that illustrates an example of a reaction that utilizes the following reagents encountered in CHEM 330 (**do not** write mechanisms – just the reactions):

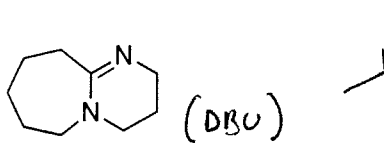
a. $Me_3SiOSO_2CF_3$



b. aq. NaBr, DMSO

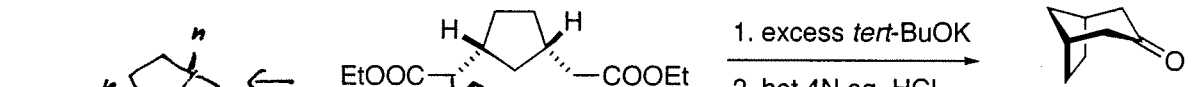


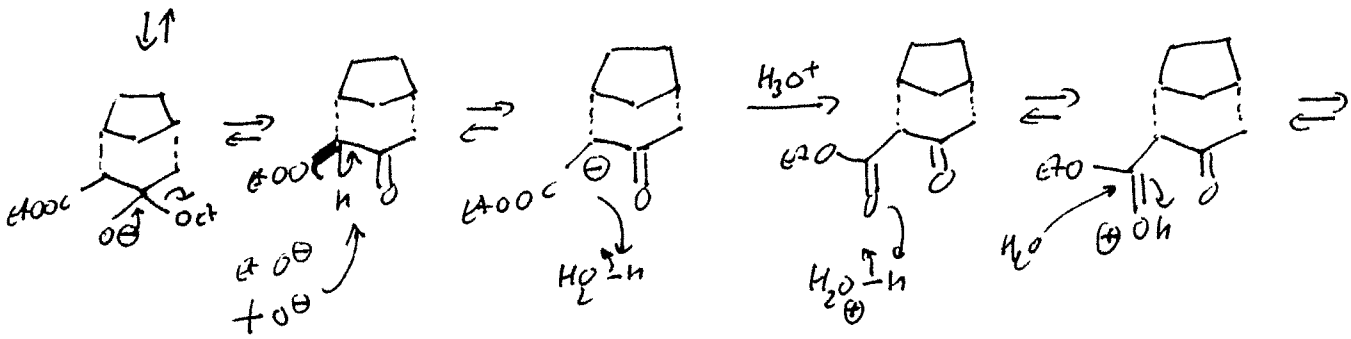
c.

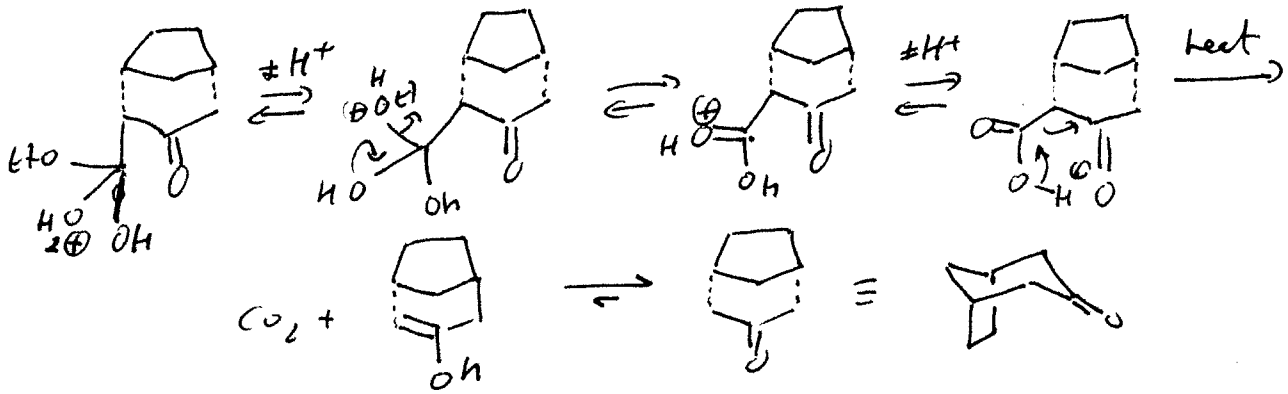


other answers are possible

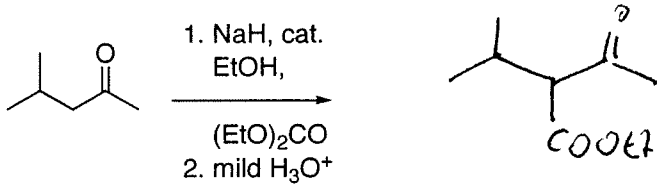
2. (12 pts.) Write a plausible mechanism for the following known reaction:

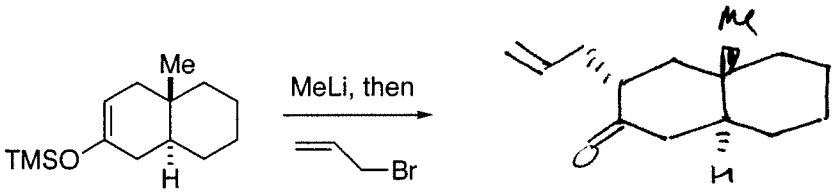


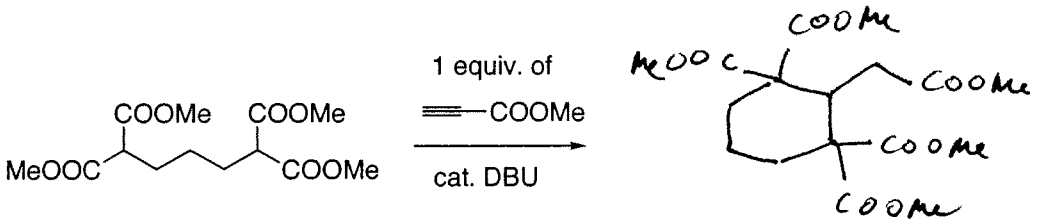


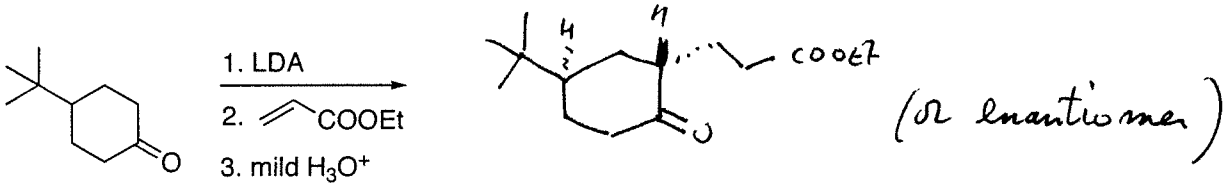


3. (28 pts.) Draw the structure of the major product expected from each of the reactions shown below. Note: it is understood that each reaction is subject to a final aqueous workup.

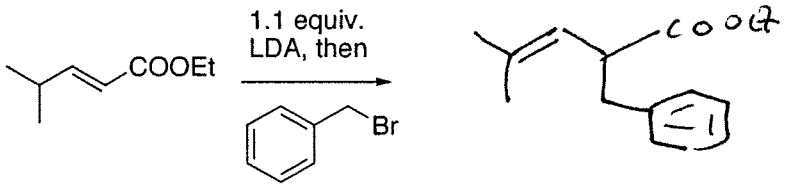
a. 

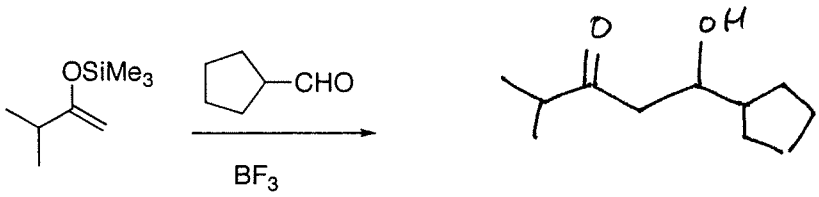
b. 

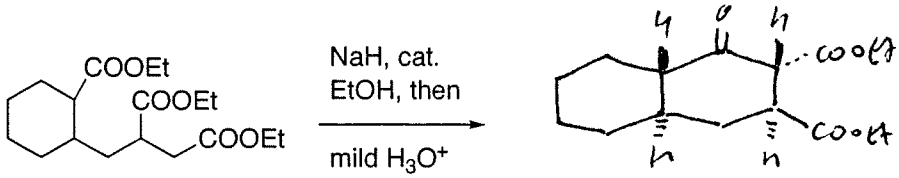
c. 

d. 

(or enantiomer)

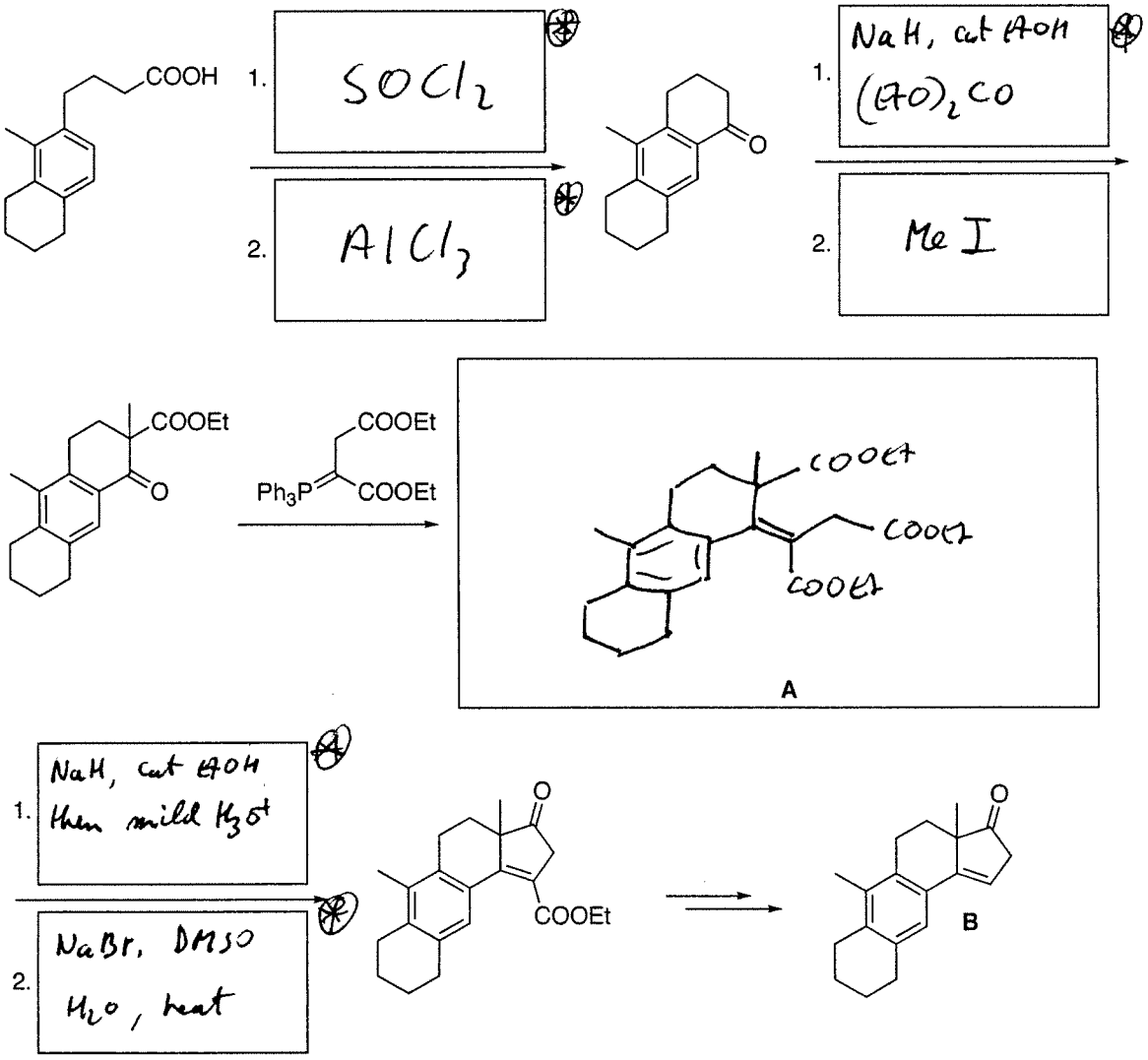
e. 

f. 

g. 

(no stereochemistry here)

4. (24 pts.) Acid-catalyzed isomerization of steroids related to vitamin D produces a compound that is based on structure **B**. A synthesis of **B** was devised as shown below to provide enough material for biological studies. Complete this reaction diagram by writing in <u>all missing reagents</u> and the <u>structure of intermediate **A**</u>.

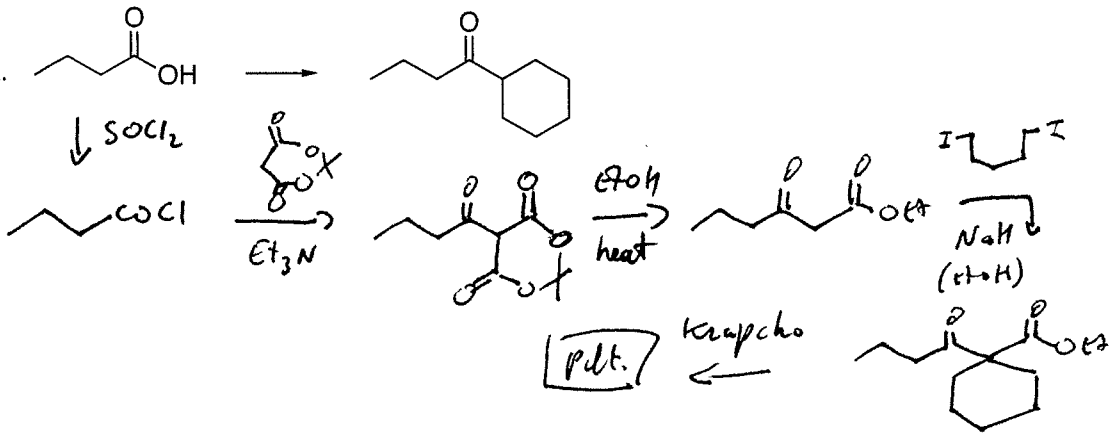


(cf. *J. Am. Chem. Soc.* **1959**, *81*, 3697).

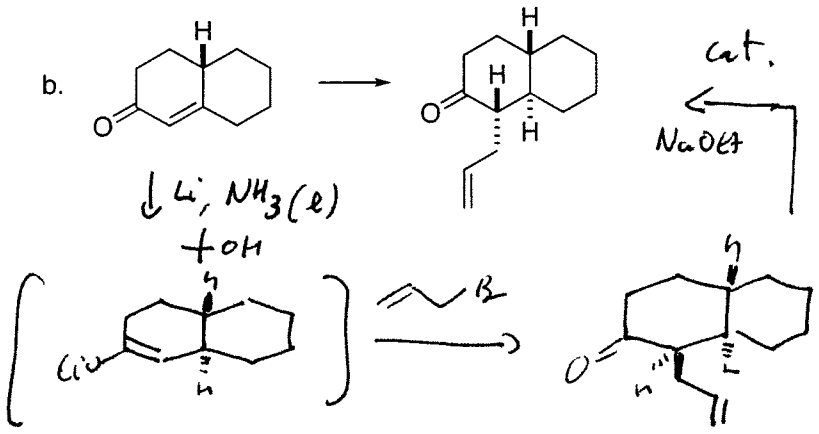
* Note: other reagents are possible

5. (24 pts.) Propose a method to achieve the following transformations. In each case, a multistep sequence (= not just one reaction, but several) may be required. Present your answer as a clear flowchart that shows all intermediates and necessary reagents. **It is not necessary to draw mechanisms.**

a.



b.



c.