CHEM 330

Midterm Exam
October 26, 2005

Your name: _____

This a closed-notes, closed-book exam

The use of molecular models is allowed

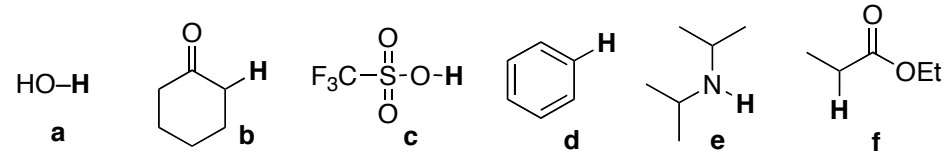
Time: 50 min

this document contains 5 pages

1.	_____	/ 12
2.	_____	/ 18
3.	_____	/ 25
4.	_____	/ 15
5.	_____	/ 30
TOTAL	_____	/100

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

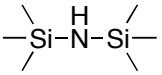
1. (12 pts.) Arrange the following compounds in order of increasing Bronsted acidity (= least acidic to most acidic) of the protons in boldface. Write your answer in the boxes provided below.



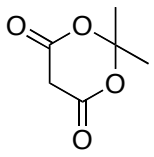
least acidic ☐ ☐ ☐ ☐ ☐ ☐ most acidic

2. (18 pts) Reagents **a** - **c** below find use in certain reactions discussed in class. Write a chemical equation that illustrates the use of each one of such reagents (**do not** write mechanisms – just the reactions).

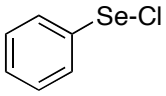
a



b

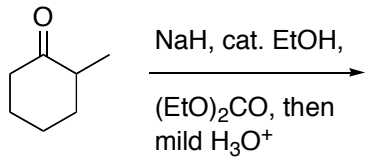


c

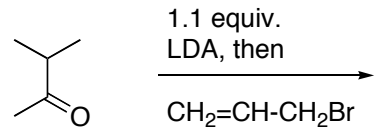


3. (25 pts.) Predict the structure of the major product expected from each of the reactions shown below. Note: it is understood that each reaction is subject to a final aqueous wortkup.

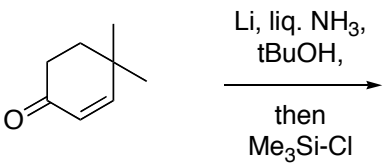
a



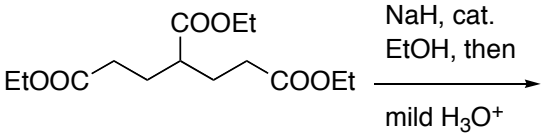
b



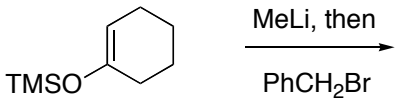
c



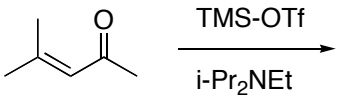
d



e



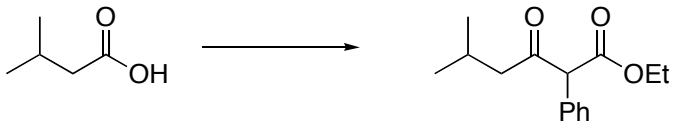
f



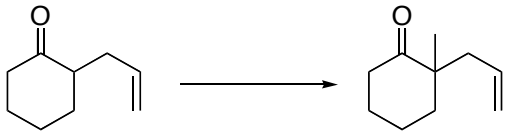
4. (15 pts.) Provide a statement of the "Principle of Least Motion" and illustrate a case in which such a principle may be invoked to rationalize the outcome of a chemical reaction.

5. (30 pts.) Propose a method to accomplish the transformations shown below. In each case, a multistep sequence (= not just one reaction, but several) may be required. Assume the availability of all reagents needed to convert the starting material into the product (e.g, bases, alkyl halides, etc.). Present your answer as a flowchart. **It is not necessary to draw mechanisms**.

a



b



c