Cover Sheet! EXAM3

CHEM230-001 FALL 2003

PRINT your name legibly on the line below.

_____

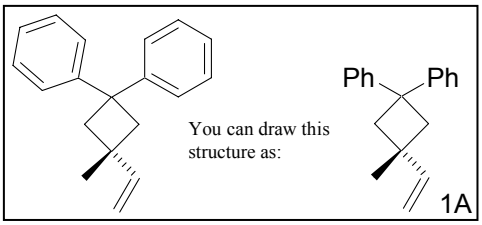
Name: _____ Student ID No:_____

First: You are allowed to have a writing utensil, a calculator and molecular model set at your seat. Please put away all other materials.
Second: Place your student identification on your desk. A proctor will come around to check everyone's ID. **Is your name and number on your test?**
Third: Quickly read through the entire exam. Your goal, as always, is to score as many points as possible. Do not waste time on problems that you can't do if there are easy questions to do first.
Fourth: It is critically important that your answers be written in a clear, unambiguous manner. Answers in which your intentions are unclear may not receive credit. SHOW YOUR WORK!
Fifth: READ THE INSTRUCTIONS FOR EACH PROBLEM. answer each question

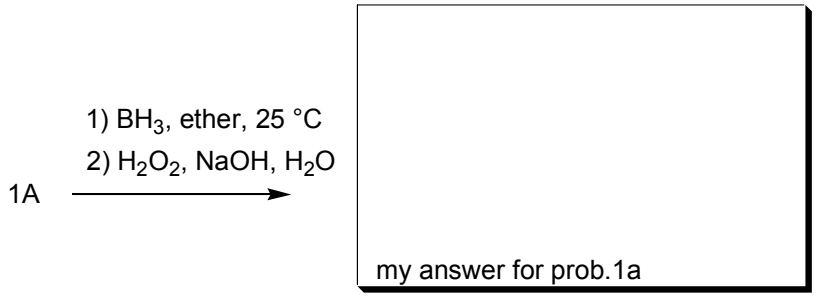
Problem Number		Points possible	Score
1a.		15	_____
1b.		15	_____
2.		20	_____
3.		10	_____
4.		10	_____
5.		10	_____
6.		10	_____
7.		10	_____
8.	above and beyond	5	_____
9.	above and beyond	5	_____

Total **100** **_____**

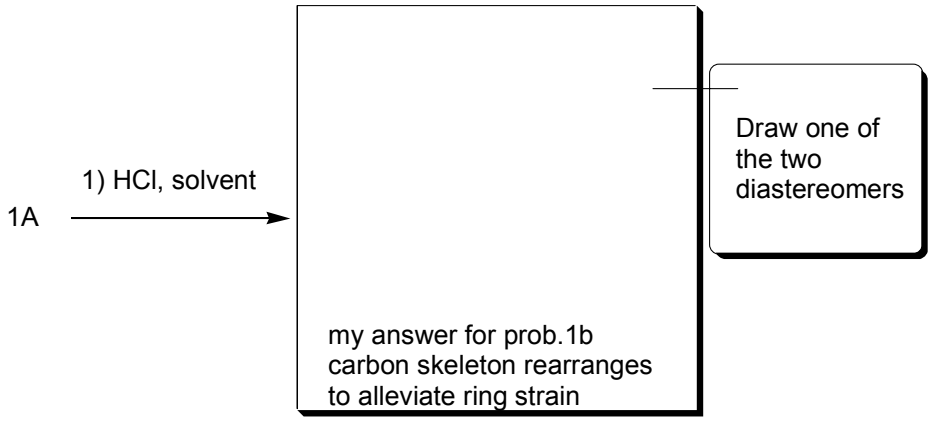
1. Predict the products. The double bonds in the benzene rings of 1A do not react under these conditions.



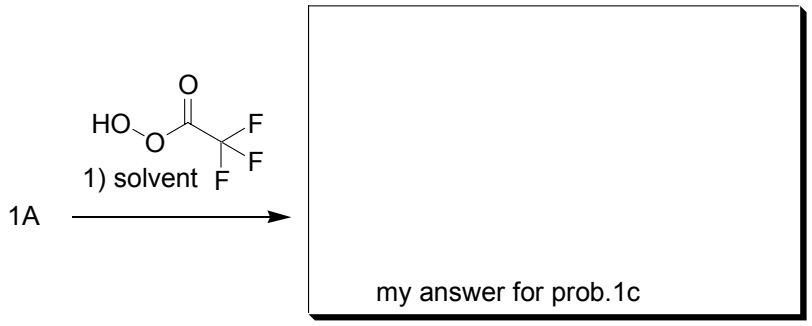
a. (10 pts.)

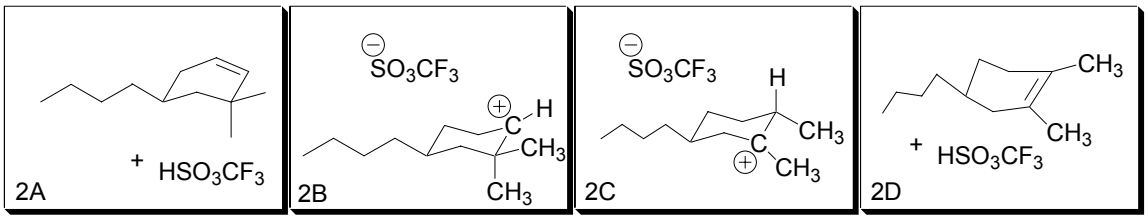


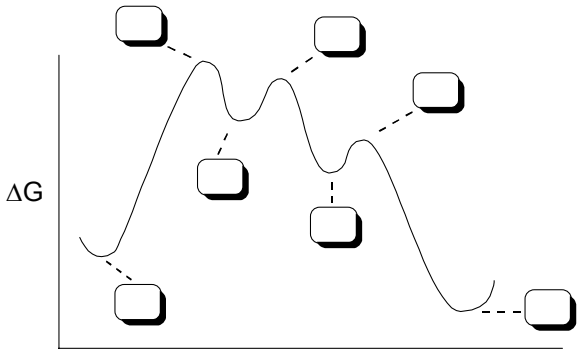
b. (10 pts.)



c. (10 pts.)







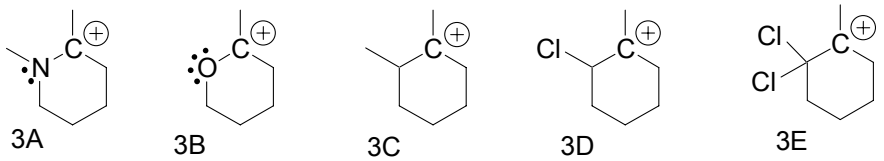
2. Consider the molecules in 2A-2D and the energy diagram above.

a. (16 pts.) Put the letters in the label boxes on the diagram. There are more labels than there are molecules. You should NOT fill in ALL the boxes with numbers!

b. (4 pts) HSO_3CF_3 is a (**circle one!**) initiator, transition state, conformer, catalyst, intermediate, diastereomer, proton acceptor, a piece of poop, tautomer, base.

3. (10 pts.) Circle the most stable cation. Draw an X over the least stable cation.

a. (5 pts.) Briefly explain your choice of the most stable carbocation.



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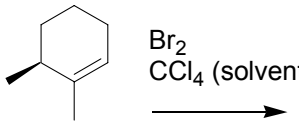
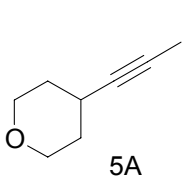
4. (10 pts.) Predict the major product of the following reaction. Be careful. Show stereochemistry.

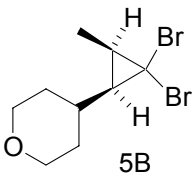


my answer to prob. 4

5. (10 pts.) Devise a synthesis of 5B from alkyne 5A. Pay attention to stereochemistry. Draw chemical reactions in the box below at right.



5A



5B

My answer to 5.

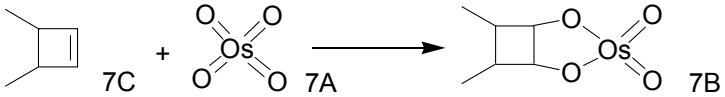
6. (10 pts) Why does the <u>alkene</u> react with acid, whereas the <u>alkane</u> does not? Be as brief as possible. You might want to draw a molecular orbital energy diagram in the margin at left if you can't put this into words.

_____

_____

_____

7. (10 pts.) What is the oxidation of Os in 7A? ___ What is the oxidation of Os in 7B? ____



7C + 7A → 7B

8. (5 pts.) How would you make 5A with starting materials possessing no more than 5 carbon atoms? Draw a chemical reaction below at left.

9. (5 pts.) Think about the reaction of 7C with ozone followed by oxidizing conditions. Draw the product below at right.

8 **9**