

Chemistry 116 Sec. A (8:00-8:50)
Exam No. 4
“Substitution and Elimination”
December 1, 2000

Instructions: You have until 8:55 a.m. to complete the exam. At that time, I will request that all remaining test takers cease writing, turn their exams over, and pass them to their rightmost isle. If you finish before 8:50 a.m. you may turn in the exam at the front of the room prior to leaving. If you finish within the final 5 min. of class, please turn your exam over and remain seated until I call for the remaining exams to be turned in. *In fairness to all, anyone still working on the exam after “time” is called will receive a grade of zero!*

Be sure to read the instructions for each question. It may be helpful to skim the entire exam and solve the easier questions first.

Exam Agreement: I, _____, have read and agree to

(Please print)

abide by the instructions above. On my honor, I have neither given nor accepted any help during this exam.

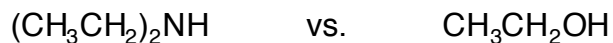
Signature: _____

College: _____

**DO NOT OPEN THIS EXAM UNTIL
INSTRUCTED TO DO SO**

1. For each pair shown below, circle the structure that best fits the description and provide an explanation for your selection. *Note:* some explanations may require illustrations to receive full credit. (7 points each)

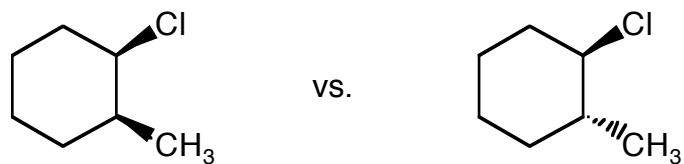
Best solvent for an E1 reaction?



Solvent that makes NaCN a stronger nucleophile?

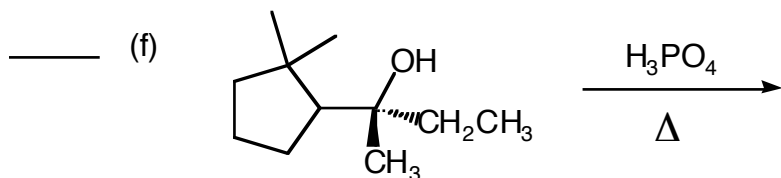
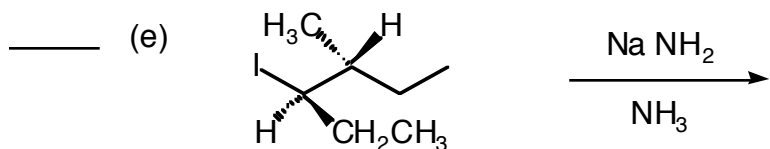
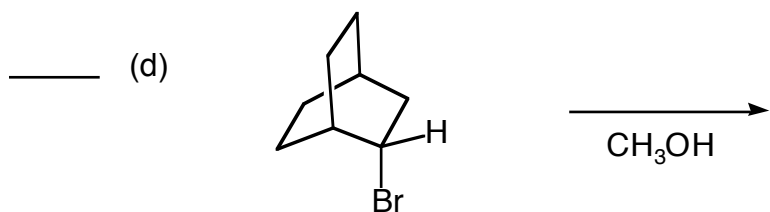
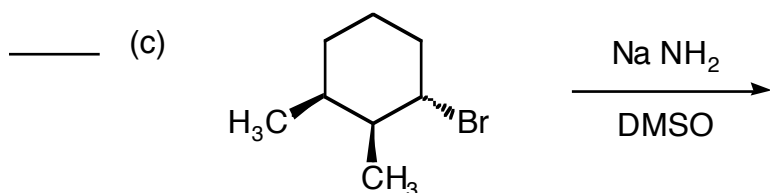
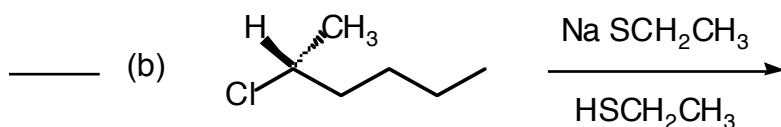
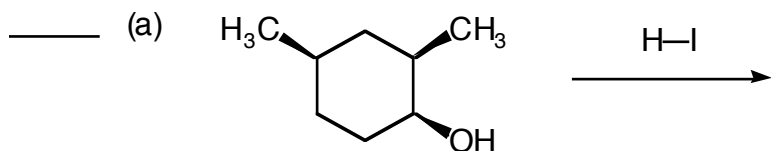


Gives the faster E2 reaction?

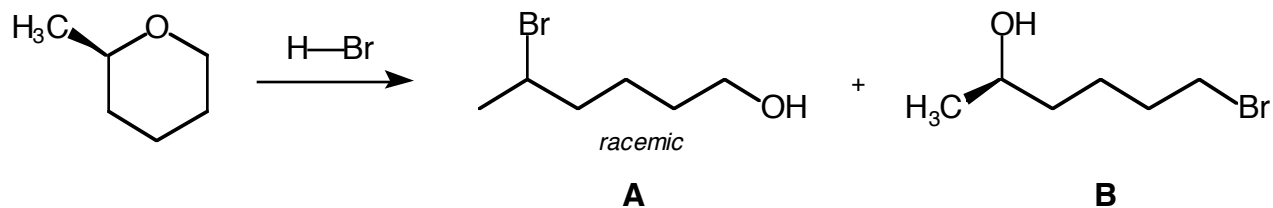


2. Draw the **major product** of each of the following reactions. For partial credit, indicate whether it is an E1, E2, S_N1, or S_N2 reaction on the line provided. *Be sure to include stereochemistry in your answers where appropriate.* (6 points each)

Type of
Reaction



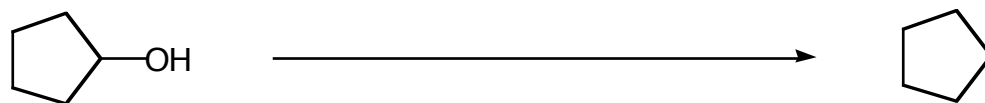
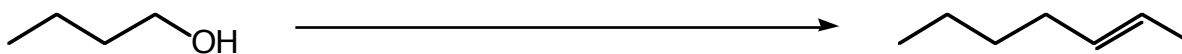
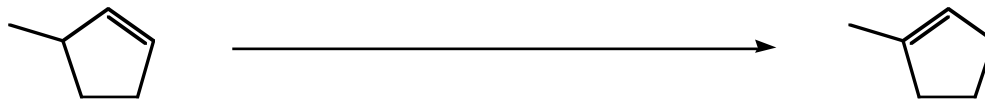
3. When the ether shown below is reacted with HBr, two sets of products are obtained. Provide mechanisms that account for the formation of the products and answer the questions that follow: (8 points)



a) What will happen to the ratio of **A**:**B** if H-Cl is used instead of H-Br? (6 points)

b) Is it possible to obtain **B** as a racemic mixture or **A** as a single enantiomer? Why or why not? (5 points)

4. (Choose 2 out of 3) Propose a synthesis (sequence of reactions) that will accomplish each of the following transformations. *Be sure to include the products of each step.* Clearly indicate which two you wish for me to grade. If no indication is made, I will grade the first two. (12 points each)



Grading Summary

Page	Point Value	Points Earned
2	21	
3	36	
4	19	
5	24	
	Total Score =	