

Chem 331  
Exam 1  
October 4, 2002  
Prof. Fox  
50 minutes

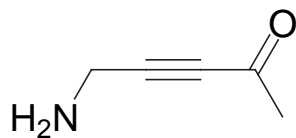
The exam is open book,  
Open notes. Models are permitted  
Show your work in detail

WRITE YOUR NAME ON EVERY PAGE

NAME \_\_\_\_\_

NAME \_\_\_\_\_

1. Give the hybridization for each non-H atom (10 points)



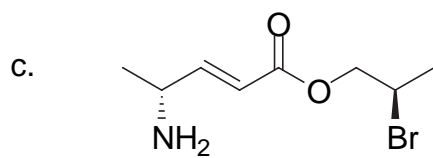
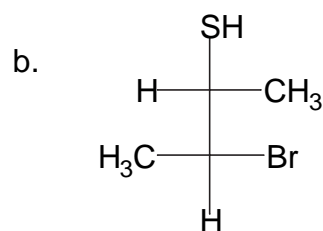
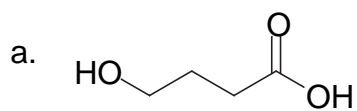
2. Draw the structure (16 points each)

a. (1R)-2,2-diethylcyclohexanecarboxaldehyde

b. (2S, 4Z)-2-methyl-4-heptenenitrile

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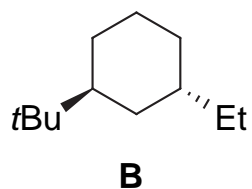
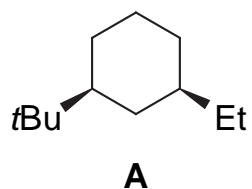
3. Give IUPAC names for each molecule (16 points each)



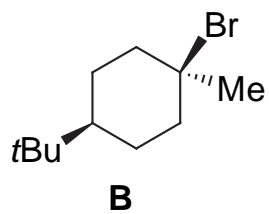
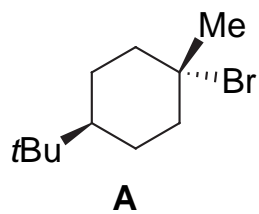
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4. (20 points each) For each pair of cyclohexanes, which is more stable. Explain your reasoning in detail (no credit for a correct guess, only a correct explanation)

*a*

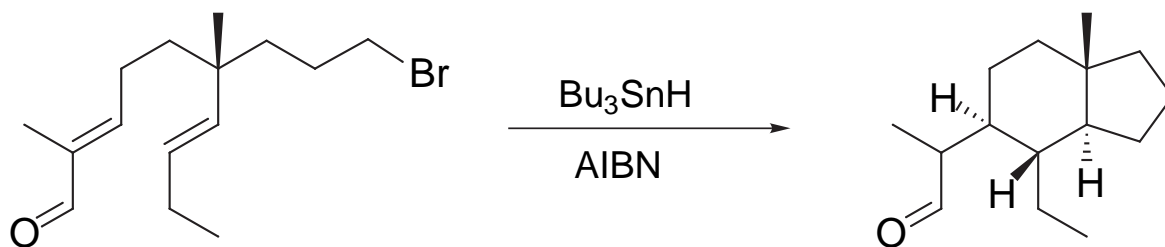


*b*



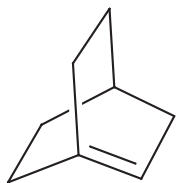
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5. Provide a detailed arrow pushing mechanism for the following reaction



NAME \_\_\_\_\_

6. The 'bridgehead' alkene **1** is extremely unstable. Use a clear orbital picture and less than 15 words to explain why. Hint: the answer has to do with the  $\pi$ -bond.



**1**