Chem 331
Fall 2011
Exam 1

Your Name_____

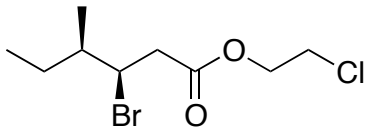
Your Name_____

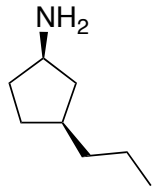
1. Draw the structure (5 points each)

(2*R*,3*S*)-3-ethyl-2-methylcyclohexanone

(2*R*,4*E*)-2-mercaptohex-4-en-1-ol

2. Give IUPAC names for each molecule (5 points each)

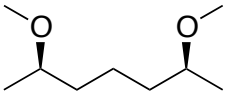


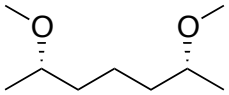


Your Name_____

3. For each pair of structures, indicate if they are the same, enantiomers, or diastereomers. If the none of these terms accurately describe the molecules, then circle “none of the above”
(5 points each)

(a)





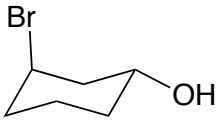
same

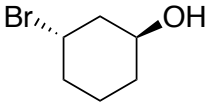
enantiomers

diasteromers

none of the above

(b)





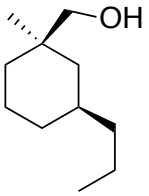
same

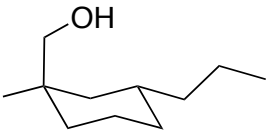
enantiomers

diasteromers

none of the above

(c)





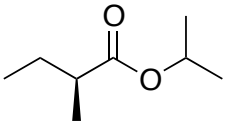
same

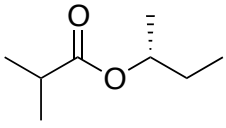
enantiomers

diasteromers

none of the above

(d)





same

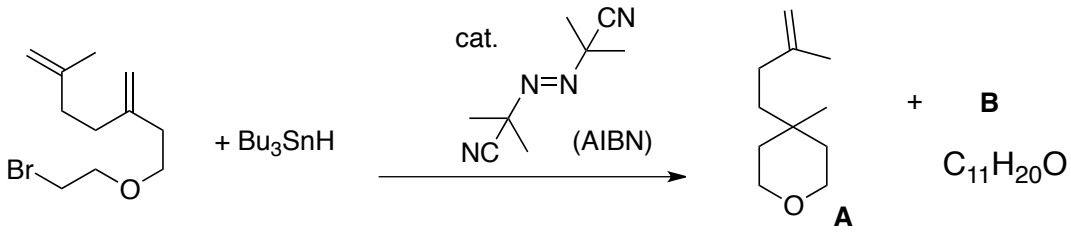
enantiomers

diasteromers

none of the above

Your Name_____

4. The reaction below produces two products, **A** and **B**



^{13}C NMR of **B**

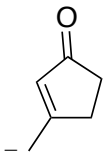
64.9, t (2 carbons)
54.6, t
42.5, t
40.4, s
37.6, s
37.2 , t (2 carbons)
28.3, q (2 carbons)
26.2, t

a. Provide a mechanism for the formation of **A** (8 points)
b. Provide a structure for **B** and a mechanism for it's formation (12 points)

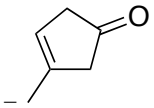
Name_____

5a. Anion **A** is more stable (lower in energy) than **B**– explain why?
Draw and compare resonance structures for **A** and **B** in support of your answer. It is NOT necessary for you to depict orbitals.

8 points



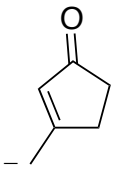
A



B

5b. Anion **A** is more stable (lower in energy) than **C**– explain why?
Draw a clear orbital picture and less than 30 words to explain why.

12 points



A

C

scratch paper