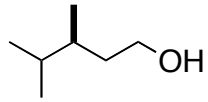
Chem 331

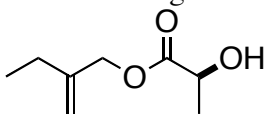
Name _____

Fall 2007
Homework #3
due: 10 a.m. Monday, September 17th

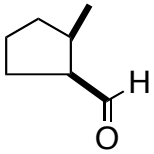
1. (12 points) Write out IUPAC names for each of the following:

a. 

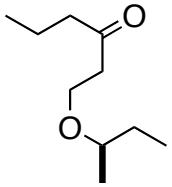
(3S)-3,4-dimethyl-1-pentanol

c. 

2-ethyl-2-propenyl (2S)-2-hydroxypropanoate

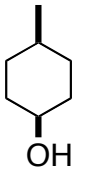
b. 

(1S, 2R)-2-methylcyclopentanecarbaldehyde

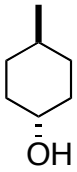
d. 

1-((1R)-1-methylpropoxy)-3-hexanone

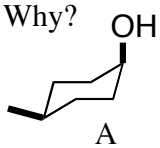
2. (12 points) a. Which is more stable, A or B? Why?



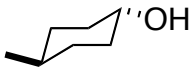
A



B



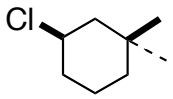
A



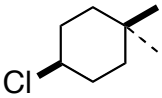
B

B is more stable. In more stable chairs, methyl group is equatorial, so in A, OH is axial, in B, OH is equatorial = more stable.

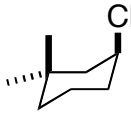
b. Which is more stable, C or D? Why?



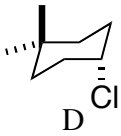
C



D



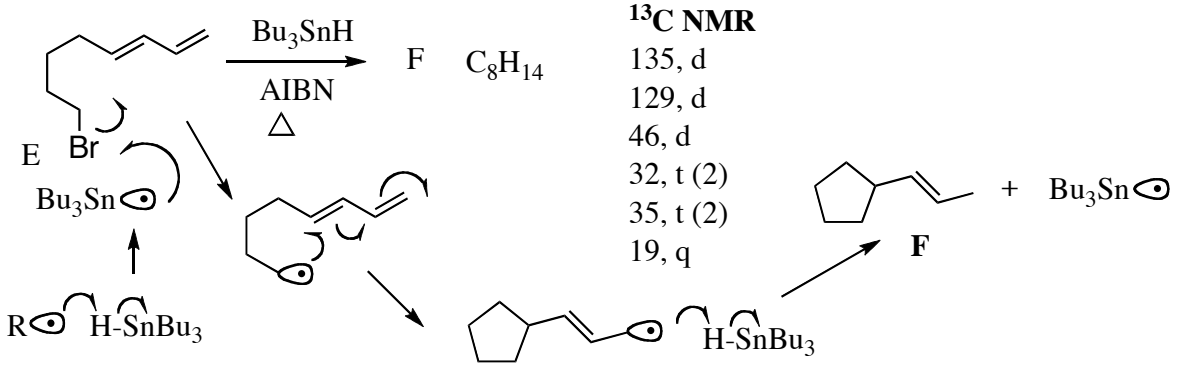
C



D

D is more stable. In the more stable chairs, the Cl is equatorial, so no difference. In the less stable chairs, the Cl is axial. In C, it would be 1,3-diaxial to one of the methyl groups. In the less stable chair of D, the Cl would only be 1, 3 diaxial to H's.

3. (6 points) Reduction of **E** with Bu_3SnH gives **F**. Deduce the structure of **F**, and draw an arrow-pushing mechanism for the transformation of **E** to **F**.



^{13}C NMR
135, d
129, d
46, d
32, t (2)
35, t (2)
19, q