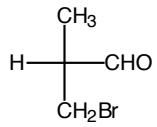
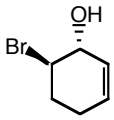
Chem 634 February 10, 2004
Pre-Problem Set Prof. Fox

1. Assign all stereochemistry (R or S; E or Z)

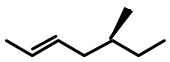
a



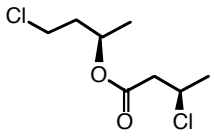
b



c

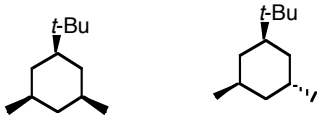


d

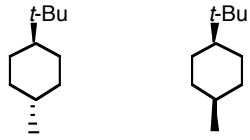


2. For each pair, which is more stable?

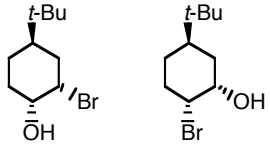
a



b

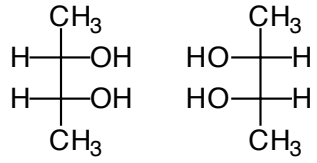


c

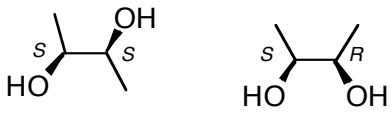


3. Indicate the relationship for each pair below: enantiomers, diastereomers, or meso

a

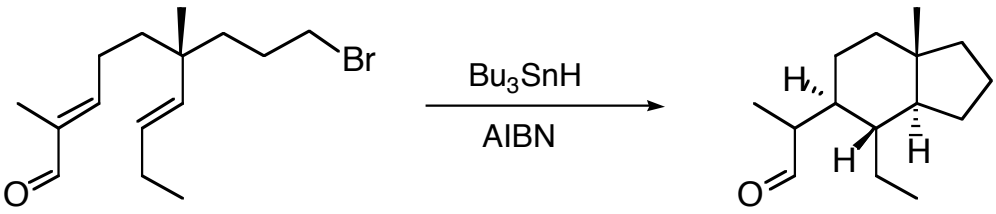


b



4) For each pair, indicate which is more stable. Use a clear picture to explain why

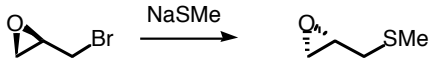
5. Provide a detailed arrow pushing mechanism for the following reaction



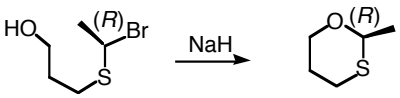
6. Draw Newman projections for the staggered and eclipsed forms of n-butane. Give the relative energies of all of the eclipsed and staggered conformers.

7. Gauche butane is ~ 0.8 kcal/mol higher in energy than anti butane. The A-strain of a methyl group on cyclohexane is ~1.7 kcal/mol. Use Newman projections to explain the relationship in detail.

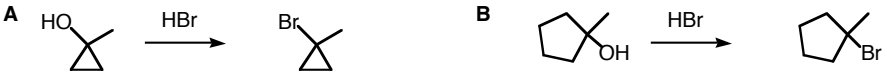
8) Provide a mechanism



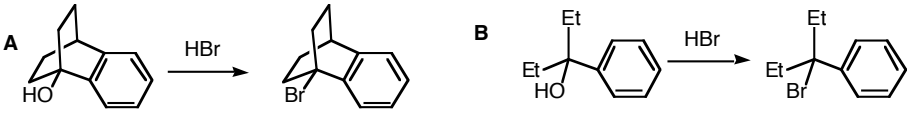
9) The reaction below is an S_N2 process. However, the absolute configurations of the starting material and products are both R. Explain. (Hint: this is a trick question).



10) Which reaction is faster (**A** or **B**)? Why?



11) Which reaction is faster (**A** or **B**)? Why?



12) Provide a detailed explanation

13) Provide a detailed arrow pushing mechanism.