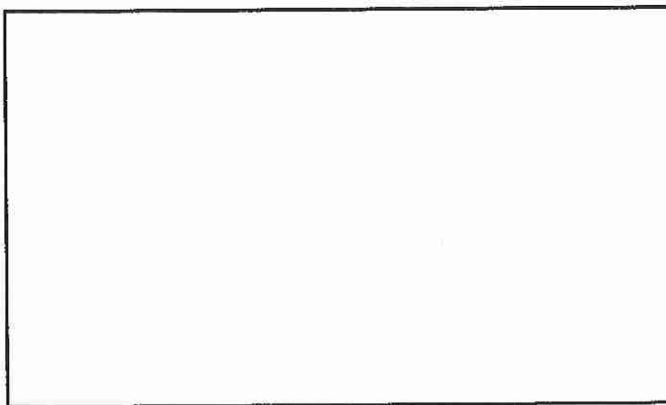
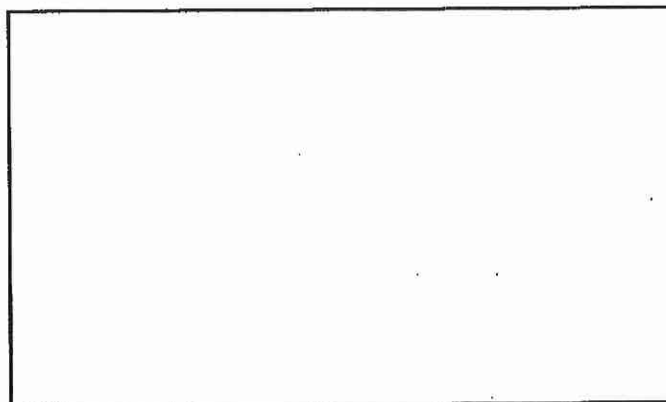
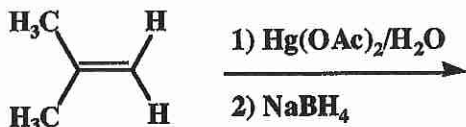


14. (3 or 5 pts each) The following reactions all involve chemistry of alkenes. Fill in the box with the product(s) that are missing from the chemical reaction equations. **Draw only the predominant regioisomer product or products (i.e. Markovnikov)** and please remember that **you must draw the structures of all the product stereoisomers using wedges and dashes to indicate stereochemistry**. When a racemic mixture is formed, you must write "racemic" under both structures **EVEN THOUGH YOU DREW BOTH STRUCTURES**.

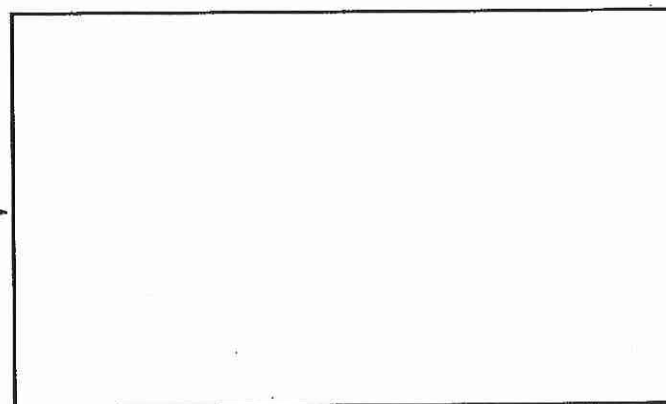
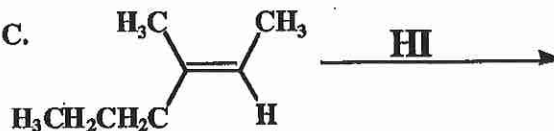
A.



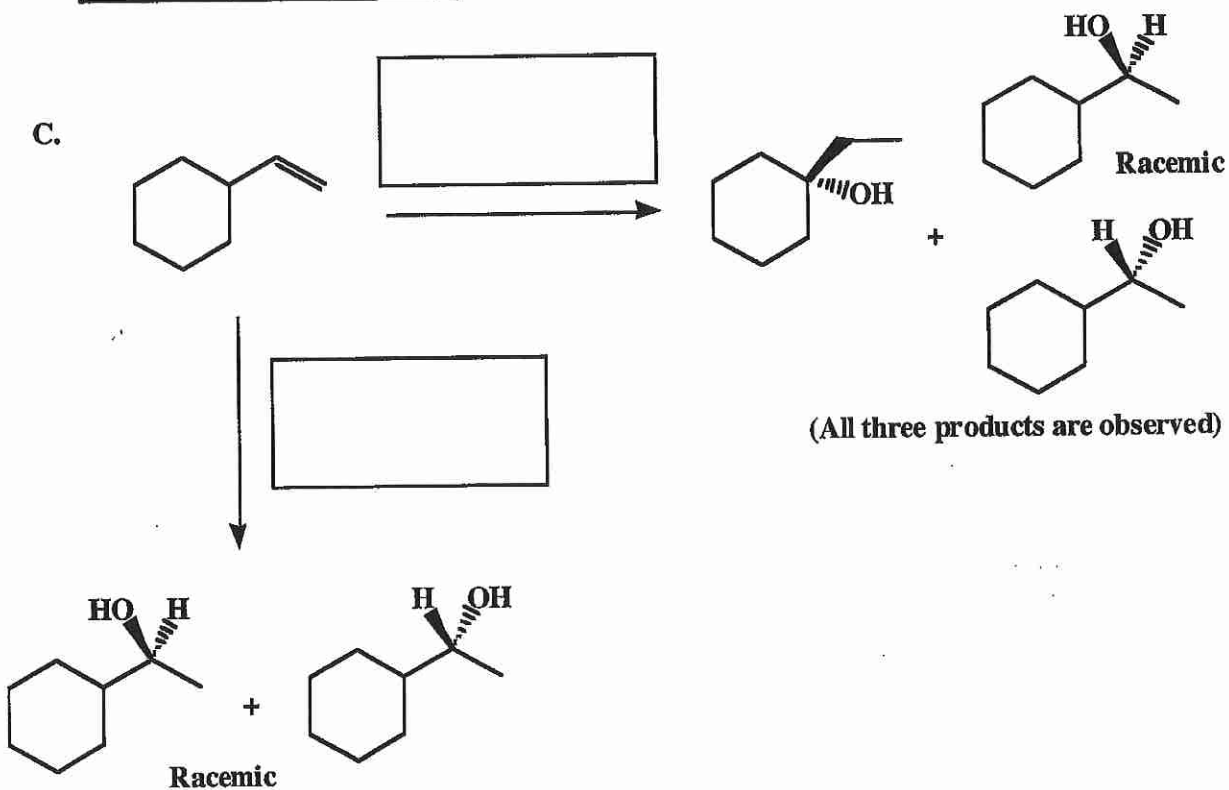
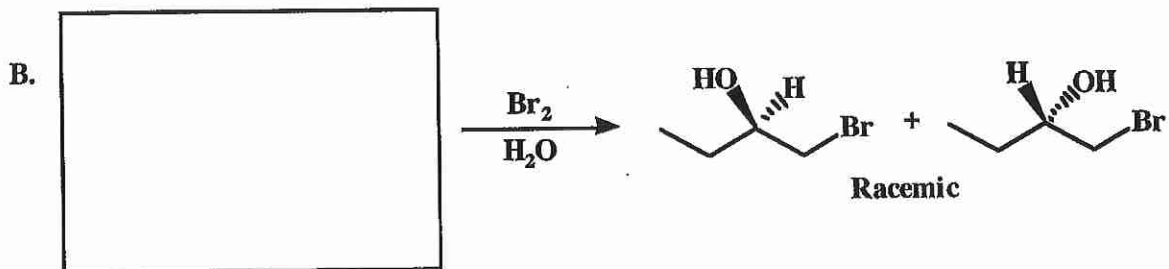
B.



C.



16. (cont.) (3 each) We are changing the format a little. For the following, we give you the predominant product or products and you need to provide either the reagents or the starting material in the box. Take your time and think about these. It is actually an important skill to be able to think about chemical reactions backwards from the product.

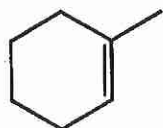
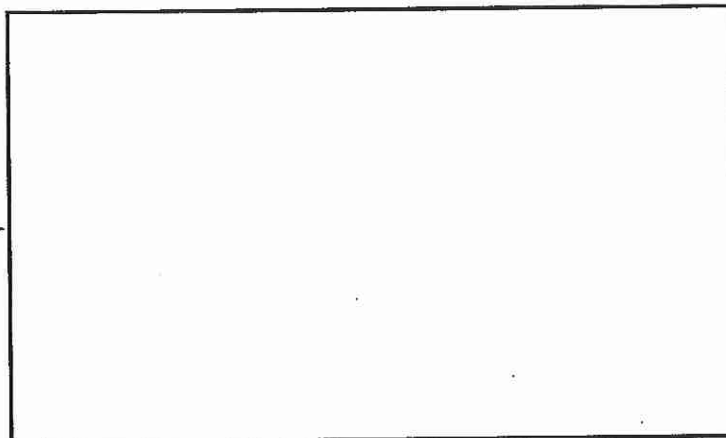


(All three products are observed)

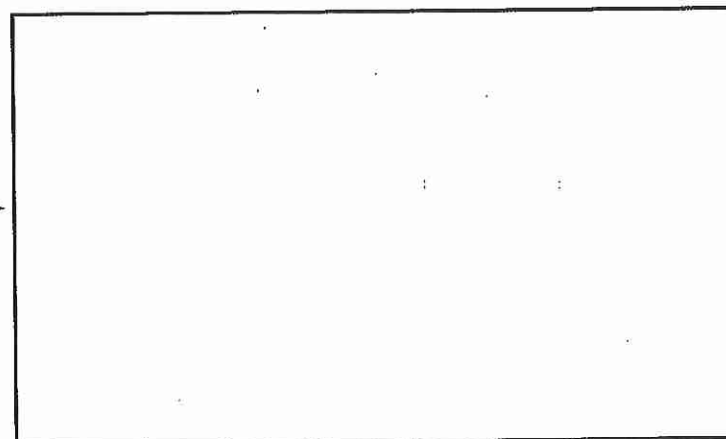
(These are the only products observed)

14. (cont.) (3-5 pts each) The following reactions all involve chemistry of alkenes. Fill in the box with the product(s) that are missing from the chemical reaction equations. Draw only the predominant regioisomer product or products (i.e. Markovnikov or non-Markovnikov products) and please remember that you must draw the structures of all the product stereoisomers using wedges and dashes to indicate stereochemistry. When a racemic mixture is formed, you must write "racemic" under all of the structures EVEN THOUGH YOU DREW ALL OF THE STRUCTURES.

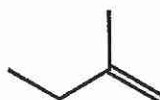
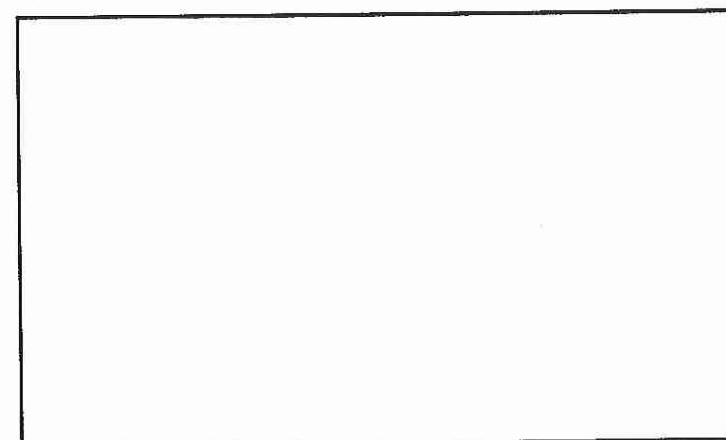
F.

 $\xrightarrow{\text{Cl}_2}$ 

G.

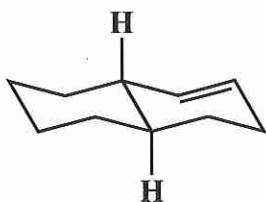
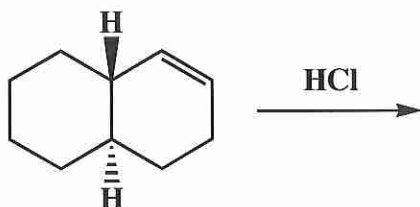
 $\xrightarrow{\text{H}_2\text{O}}$  $\text{H}_2\text{SO}_4$ 

H.

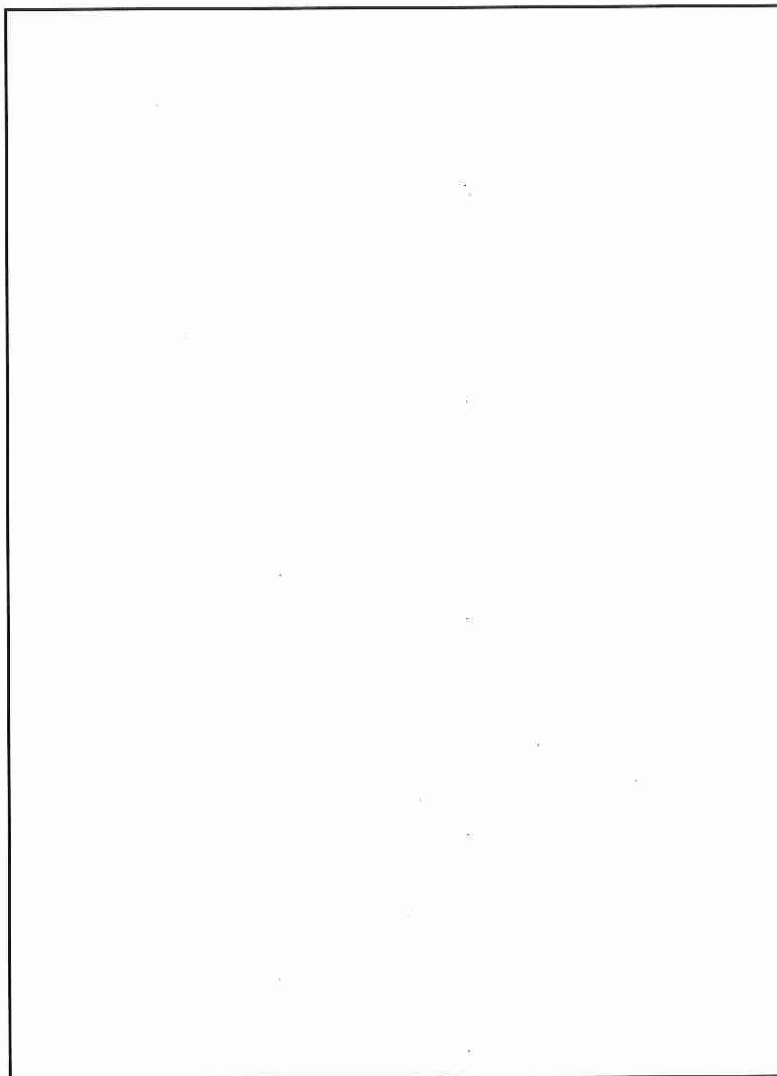
 $\xrightarrow{1. \text{BH}_3}$  $2. \text{H}_2\text{O}_2 / \text{HO}^\ominus$ 

14. For the following reaction, draw all of the expected products including the different regioisomers and stereoisomers. As an aid in understanding the stereochemistry of the starting material, we have drawn the chair form just below. Like before, write **racemic** if a racemic mixture is produced. IT is OK to draw the products in whatever format you are most comfortable with (flat rings with wedges and dashes, etc.); the chair version was only included to help you understand the starting material.

A) (12 pts) Assume no rearrangement.



Chair form of starting material

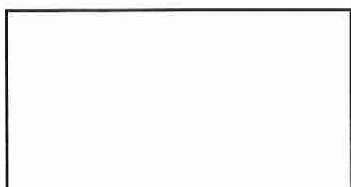


B) (6 pts) For the above mixture of products you drew for part A), would your product mixture rotate the plane of plane polarized light? Explain your answer in one or two sentences.

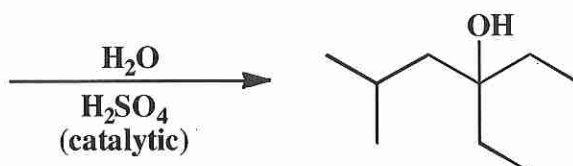
C) (6 pts) For the above products from part A), circle the two that will form the most stable chair conformations.

17. (6 pts each) The following problems are a new format. We turn the tables and give you the product. In the space provided show the starting material required to make that product using the given reagents. When more than one starting material would work, you must draw both.

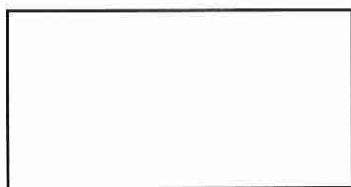
A.



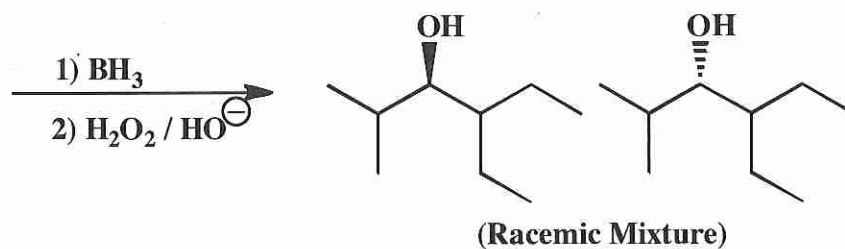
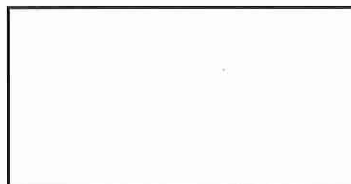
or



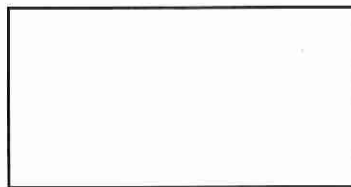
B.



or



C.



or

