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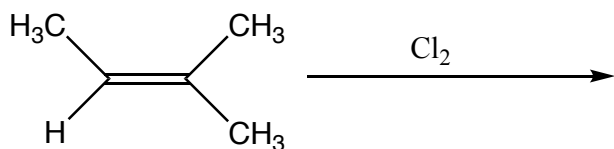
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**Chemistry 320M/328M  
Dr. Brent Iverson  
5th Homework  
October 4, 2022**

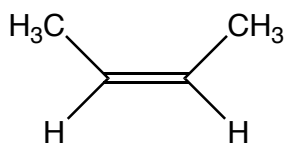
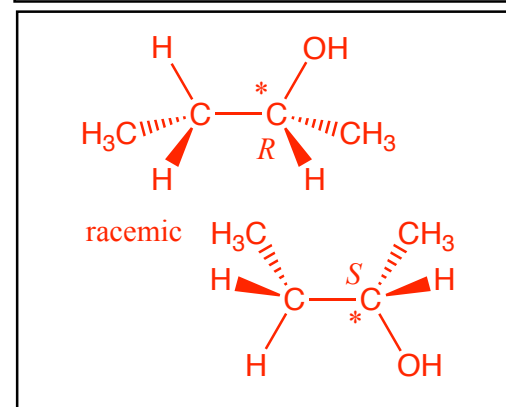
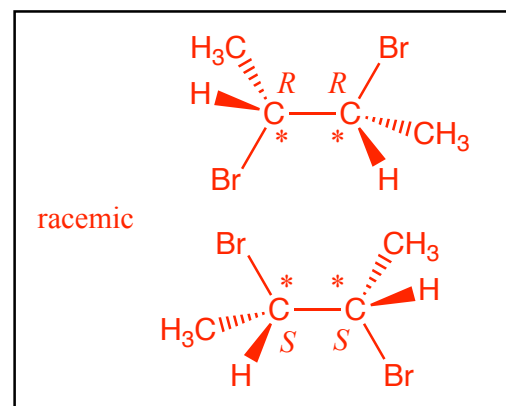
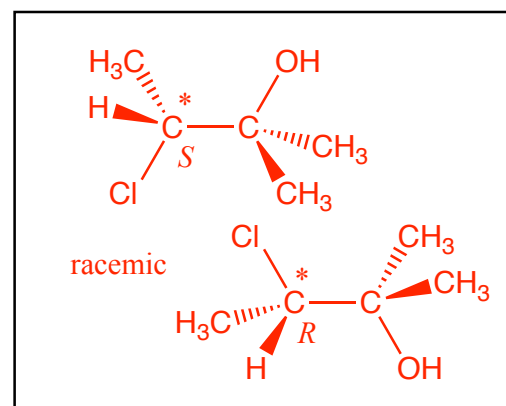
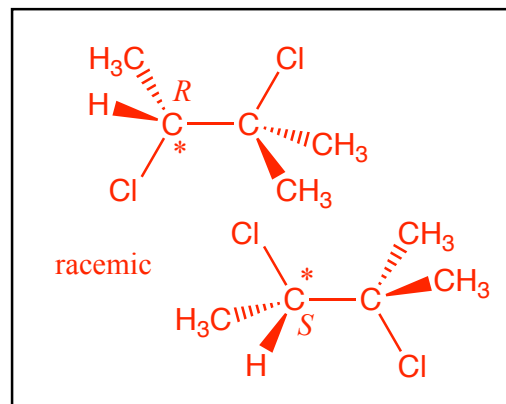
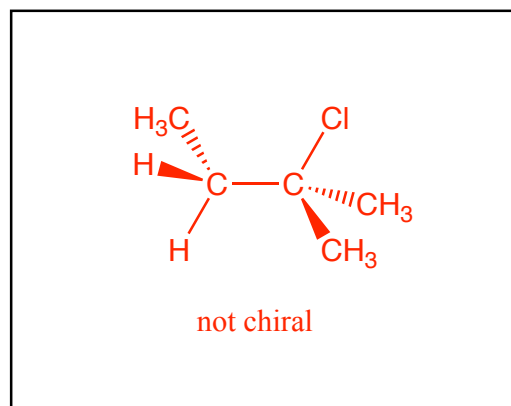
**Please print the  
first three letters  
of your last name  
in the three boxes**

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1. For the following reactions, fill in the boxes with the predominant product or products. You must indicate stereochemistry with wedges and dashes. If a racemic mixture is created, you must write "racemic" under the structures.

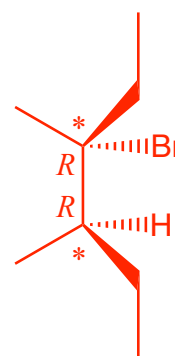
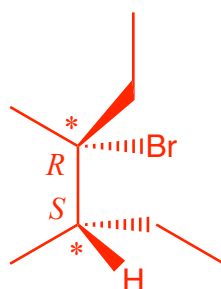
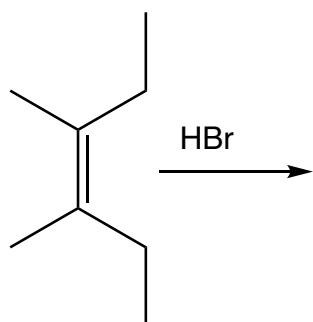


HCl

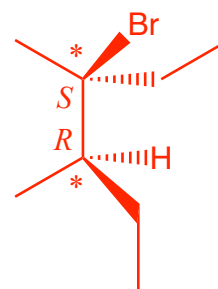
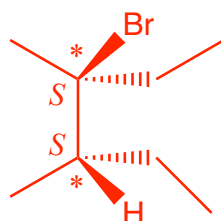
 $\text{Cl}_2$  $\text{H}_2\text{O}$ 

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

2. For the following reaction, fill in the box with the predominant product or products. You must indicate stereochemistry with wedges and dashes. If a racemic mixture is created, you must write "racemic" under the structures.

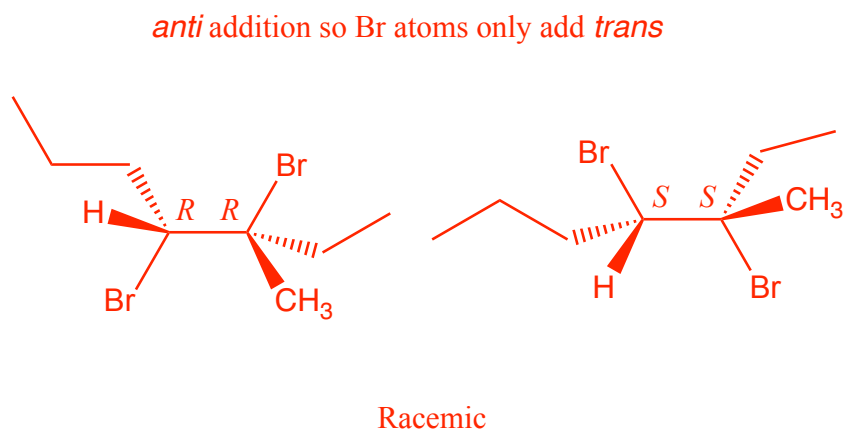
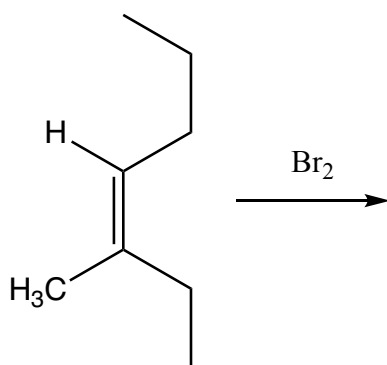


Racemic



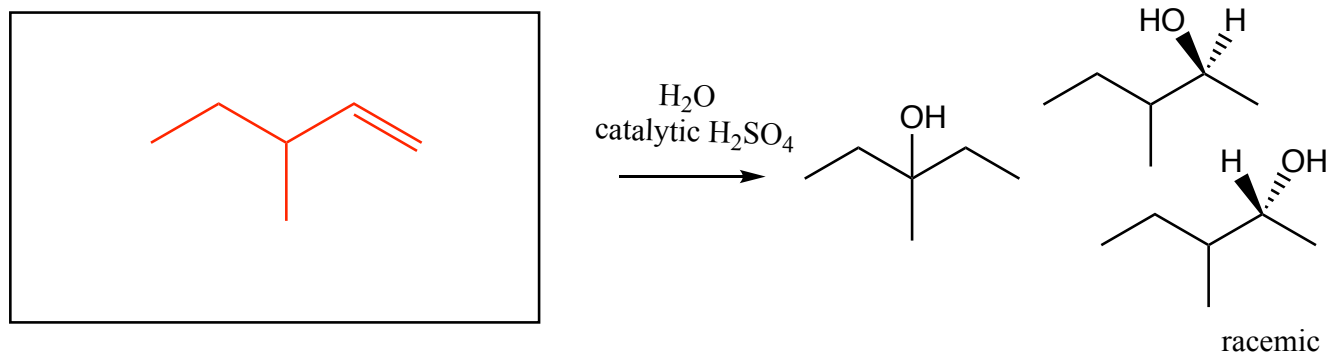
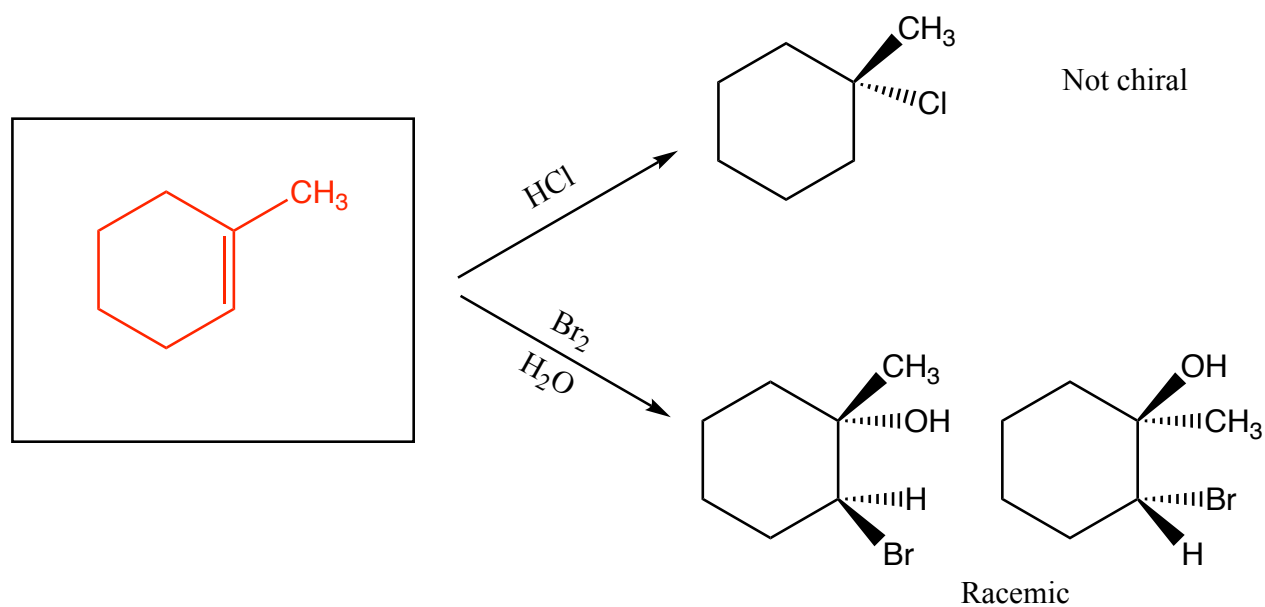
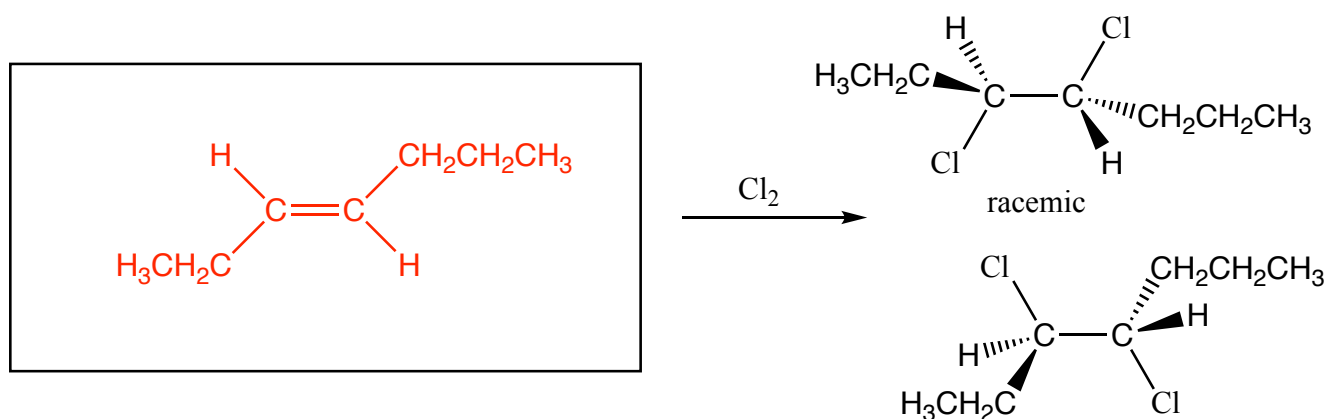
The mixed stereochemistry of HBr addition (the H and Br can add from either the same or opposite faces of the double bond) mean that you get both *cis* and *trans* products. Keep in mind you are creating two chiral centers, so there are 4 possibilities total. It is important for you to be systematic in the way you draw product stereoisomers.

3. For the following reaction, fill in the box with the predominant product or products. You must indicate stereochemistry with wedges and dashes. If a racemic mixture is created, you must write "racemic" under the structures.



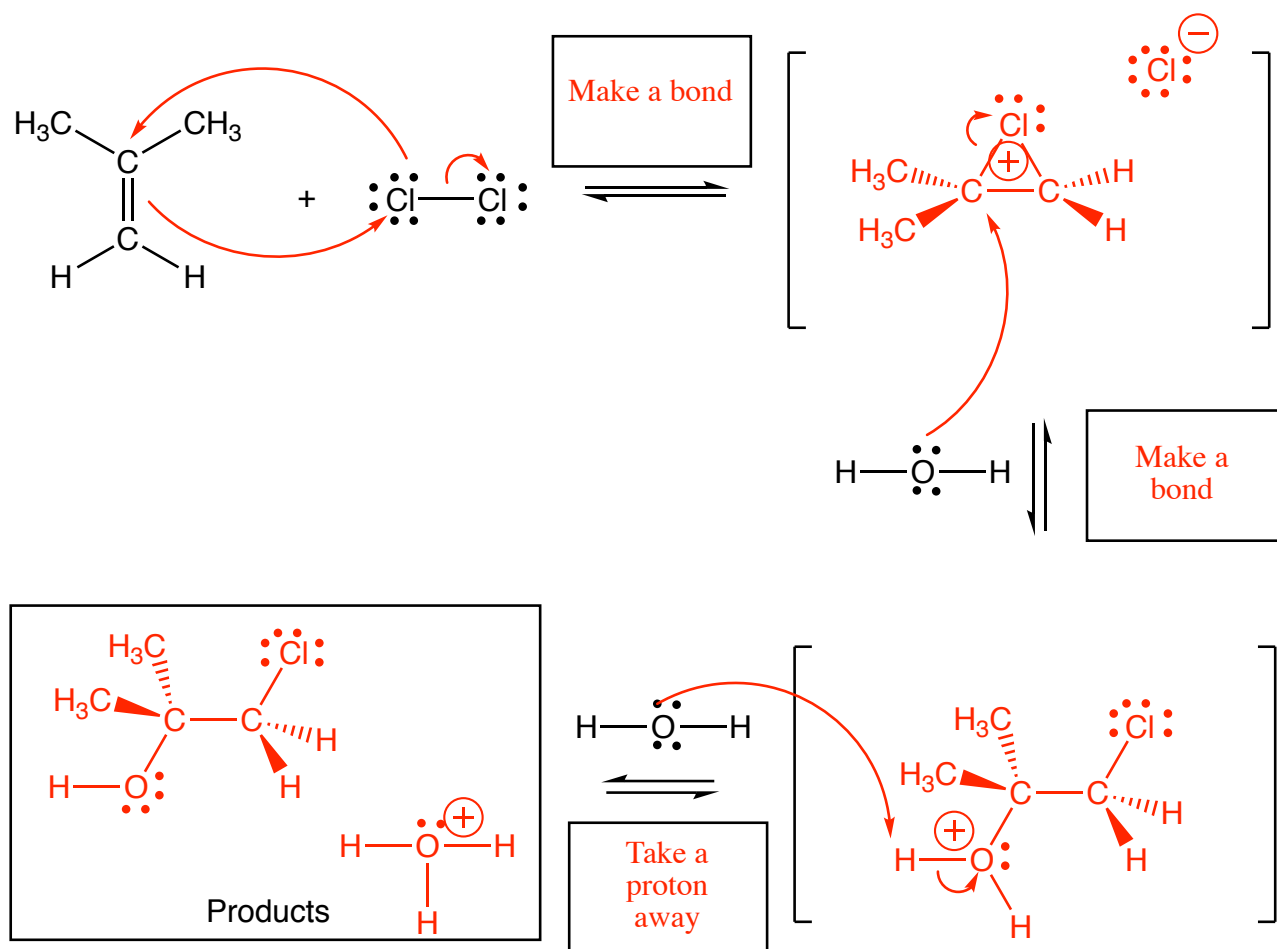
There is only one constitutional isomer here because the Br atoms add to both C atoms of the double bond. The anti addition gives only the two enantiomers shown.

4. For the following reactions, fill in the boxes with the starting material that leads to the predominant product or products.

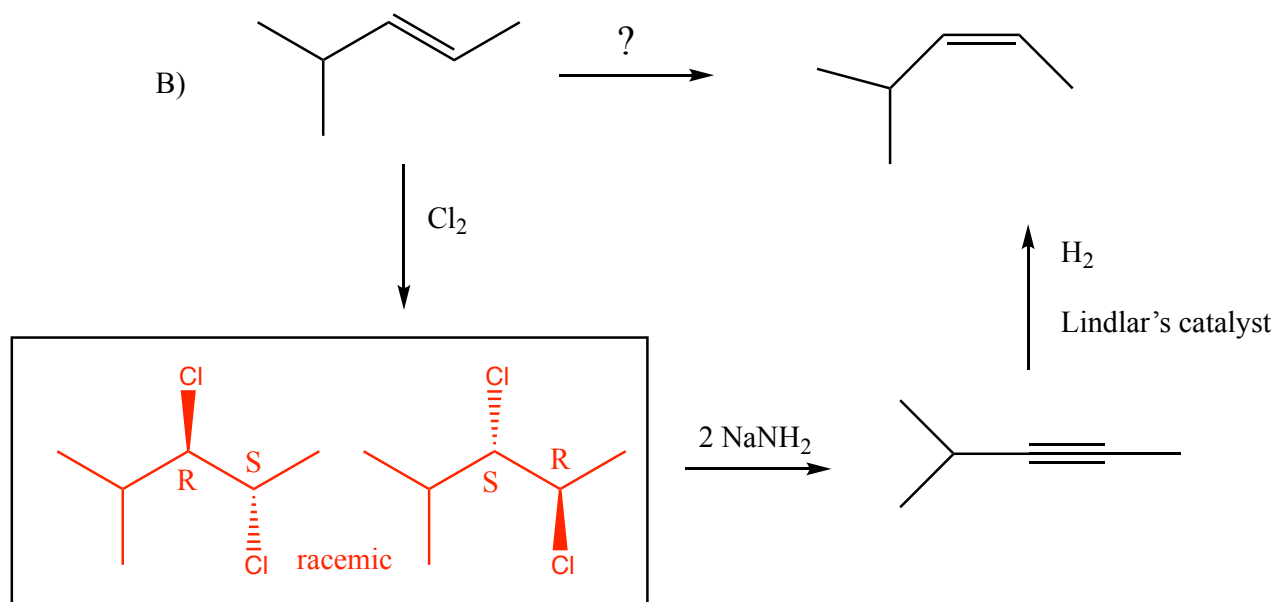
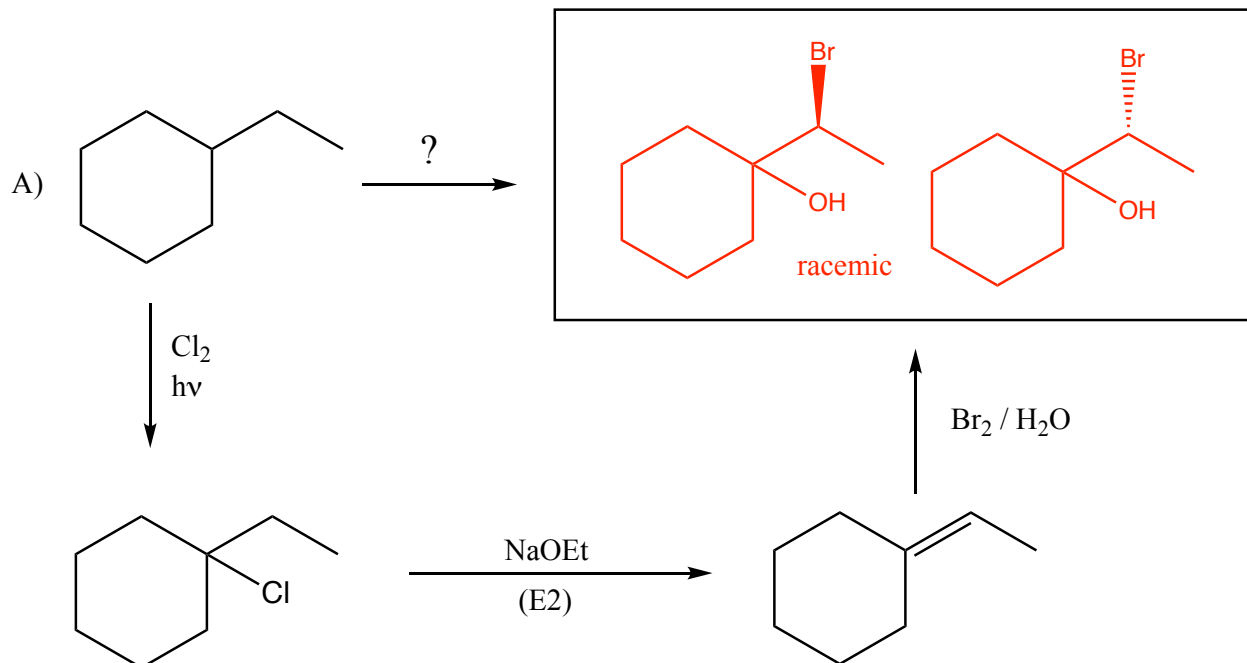


5. Read these directions carefully. For the reaction of 3-methyl-1-propene with  $\text{Cl}_2$  and  $\text{H}_2\text{O}$  shown below, fill in the details of the mechanism. Draw the appropriate chemical structures and use an arrow to show how pairs of electrons are moved to make and break bonds during the reaction. Be sure to write all lone pairs of electrons and all formal charges. Finally, in the boxes provided by the arrows, write which kind of mechanistic element is being indicated, such as "make a bond", "add a proton", etc.

*Alkene Hydrohalogenation*



6. For the following synthesis schemes, fill in the missing molecules. Note, you do not understand all of this chemistry yet, but soon you will and then you will be responsible for the entire sequence of synthetic reactions! Even if you have not seen all the chemistry, please take a moment to see what kind of transformations are occurring in each step of the synthesis.



7. For the following synthesis scheme, fill in the missing molecules. Note, you do not understand all of this chemistry yet, but soon you will and then you will be responsible for the entire sequence of synthetic reactions! Even if you have not seen all the chemistry, please take a moment to see what kind of transformations are occurring in each step of the synthesis.

