**NAME (Print):** _____

**SIGNATURE:** _____

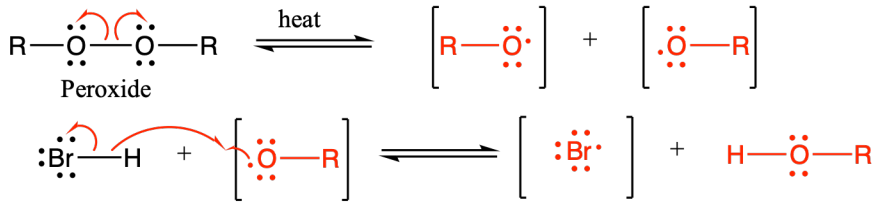
**Chemistry 320M/328M**
**Dr. Brent Iverson**
**8th Homework**
**October 28, 2026**

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

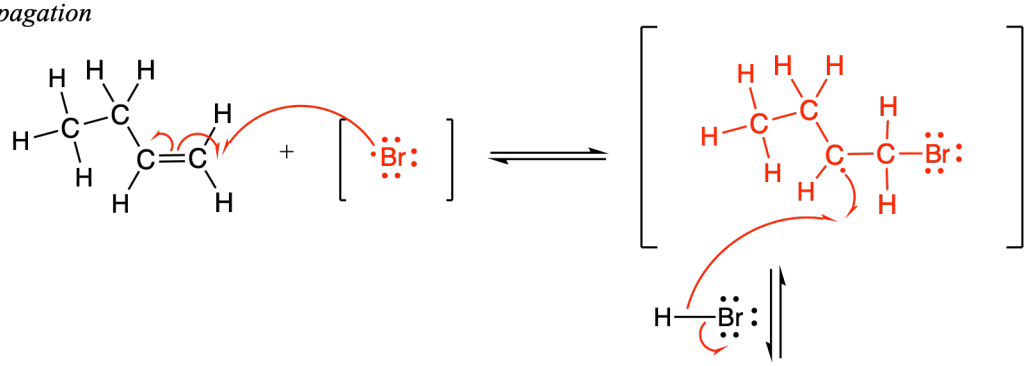
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|---|---|---|
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1. Complete the mechanism for the following non-Markovinikov addition of HBr to an alkene reaction. Be sure to show arrows to indicate movement of all electrons, write all lone pairs, all formal charges, and all the products for each step. Remember, I said all the products for each step. YOU ONLY NEED TO DRAW ONE STEREOISOMER OF A CHIRAL INTERMEDIATE OR PRODUCT (using wedges and dashes as appropriate) IF A NEW CHIRAL CENTER IS CREATED IN AN INTERMEDIATE OR PRODUCT, MARK IT WITH AN ASTERISK AND LABEL THE MOLECULE AS "RACEMIC" IF APPROPRIATE.

*Initiation*

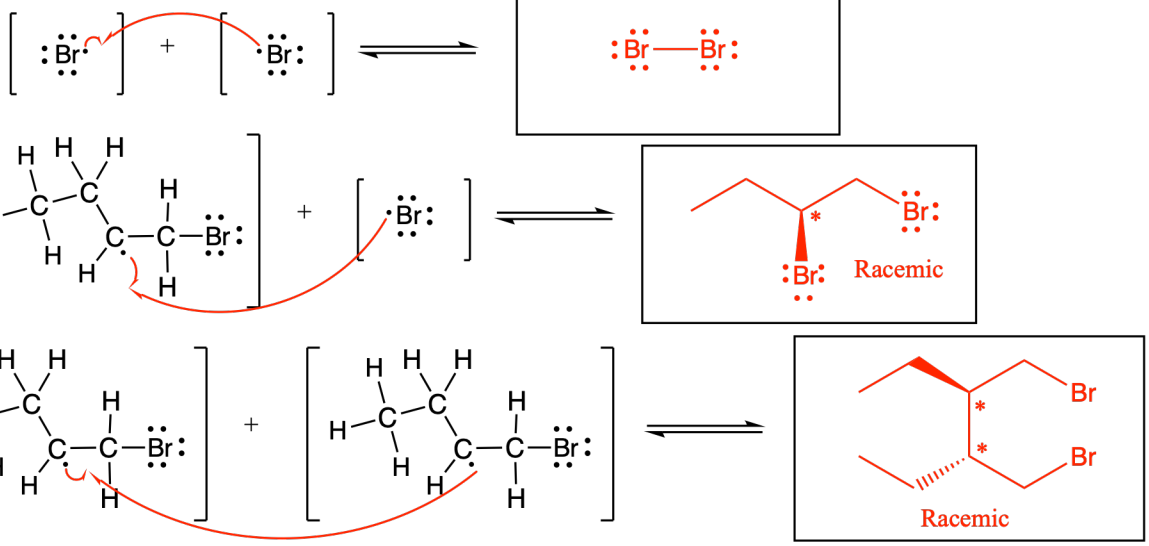



*Propagation*



Products

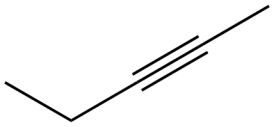
*Termination*



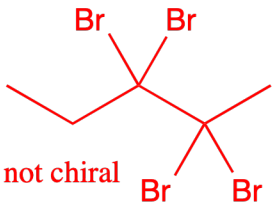
2. Succintly define Hammond's postulate.

Hammond's postulate says that the transition state for an exothermic step resembles the reactants more than the products of that step, and the structure of the transition state for an endothermic step resembles the products more than the reactants of that step.

3. For the following, complete the reactions 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.



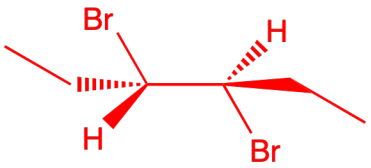
$2\ Br_2$

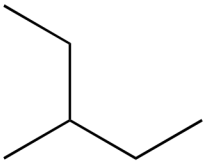





$Br_2$

(anti addition)

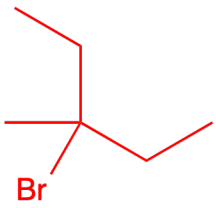


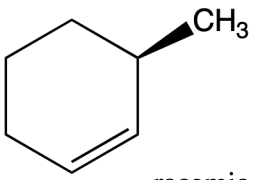
$Br_2$

hν

(reacts at more substituted C atom)

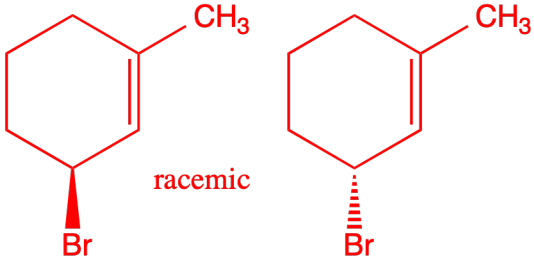



Think about this one!!



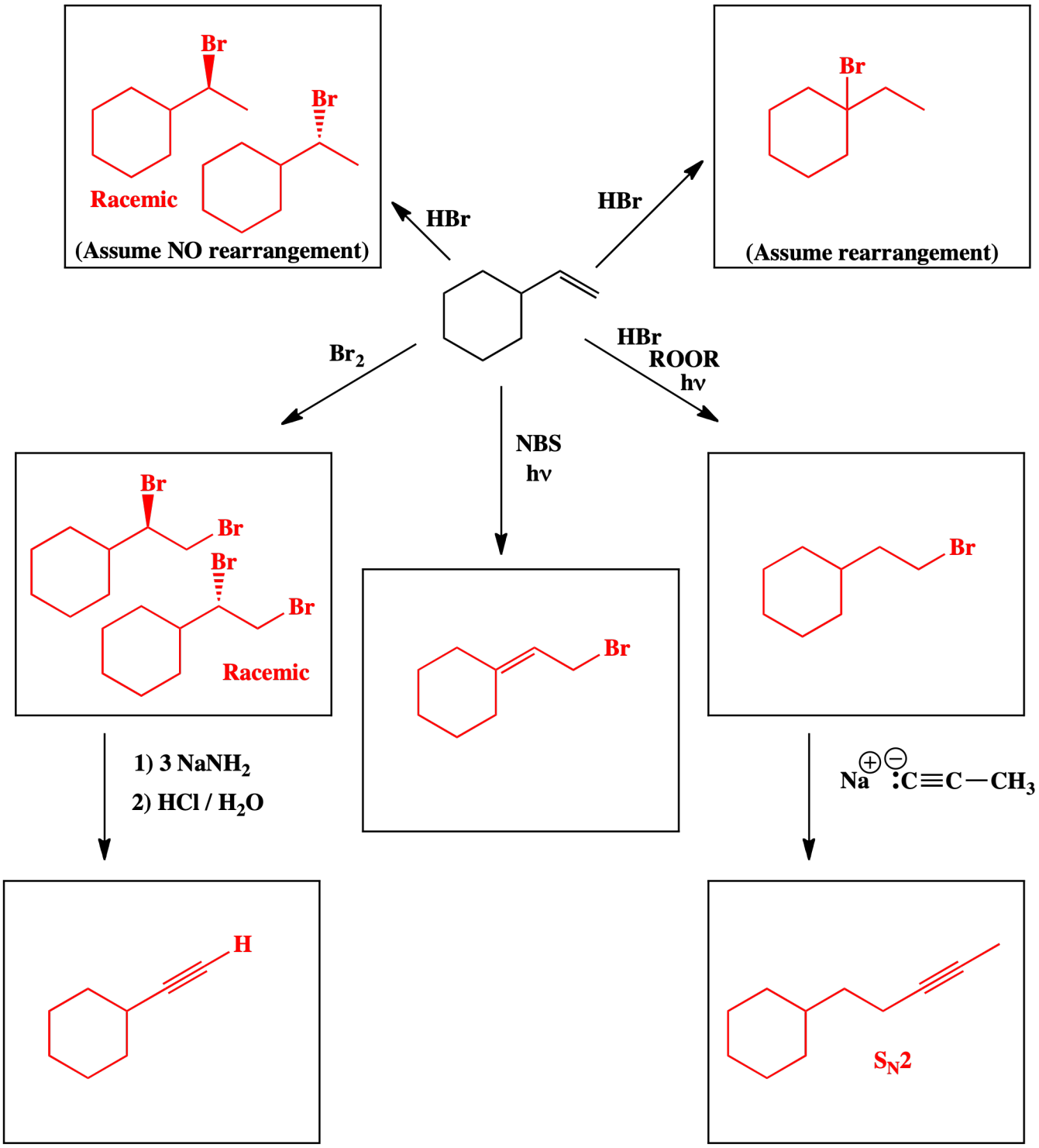

NBS

hν

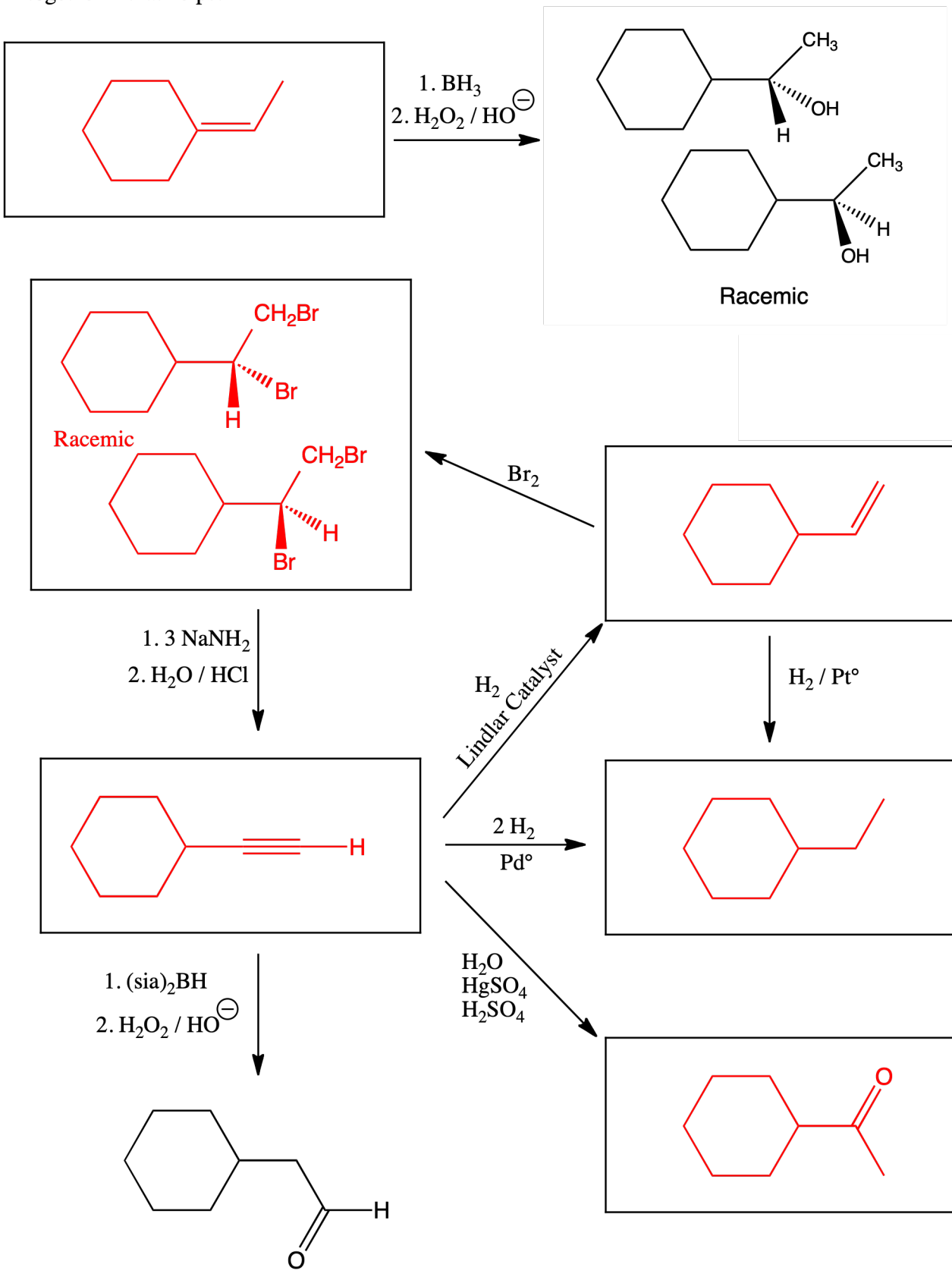



The most stable alkene removes the chiral center at methyl.

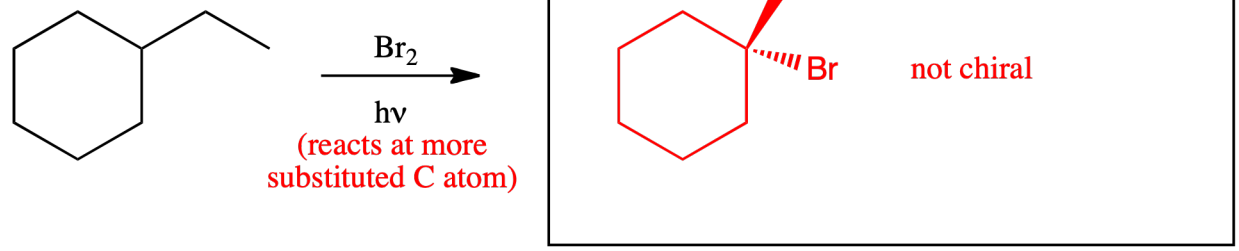
4. For the following, complete the reactions with the predominant product or products. You must indicate stereochemistry with wedges and dashes. If a racemic mixture is created, you must write "racemic" under the structures.

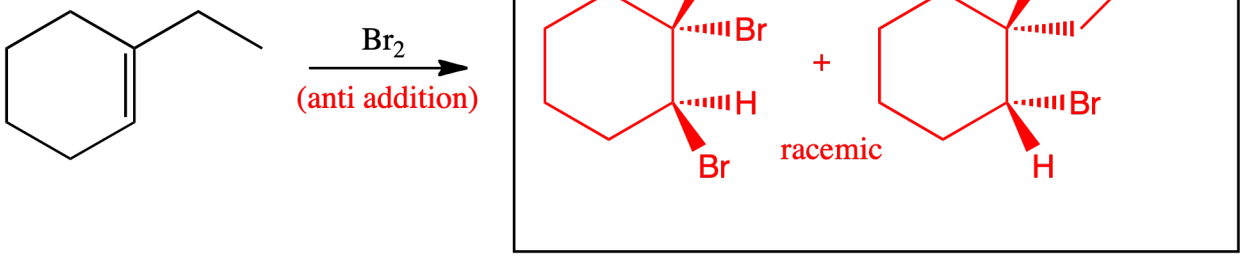


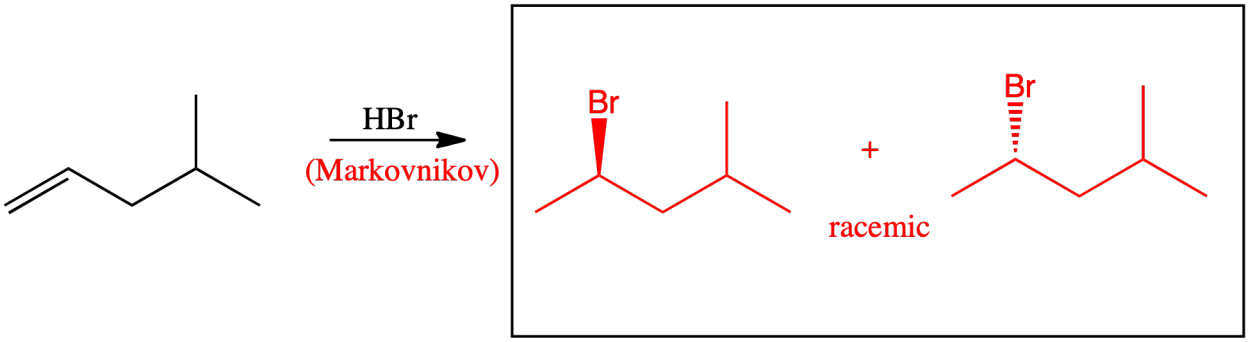
5. (3 or 5 pts each) For the following reactions, fill in the boxes with the appropriate structures. I know this is pretty hard, but I think it will be a great way to study your alkene and alkyne reactions. Work together if that helps.

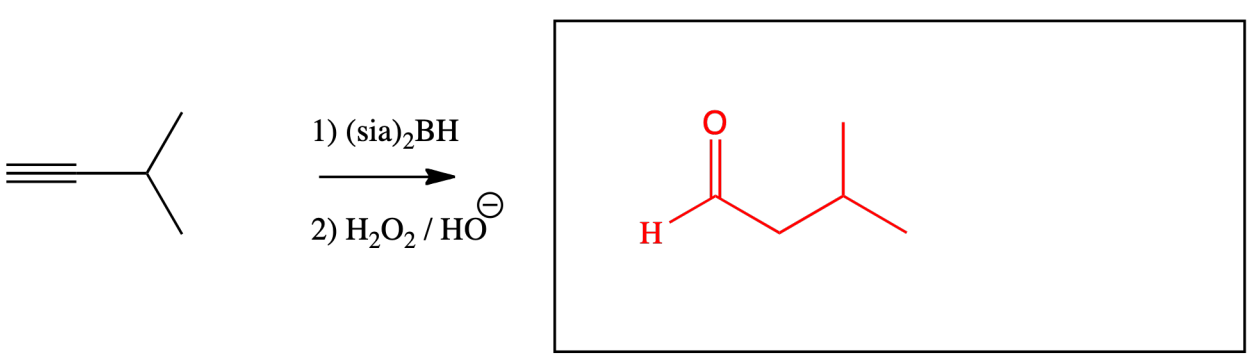


6. For the following, complete the reactions with the predominant product or products. You must indicate stereochemistry with wedges and dashes. If a racemic mixture is created, you must write "racemic" under the structures.

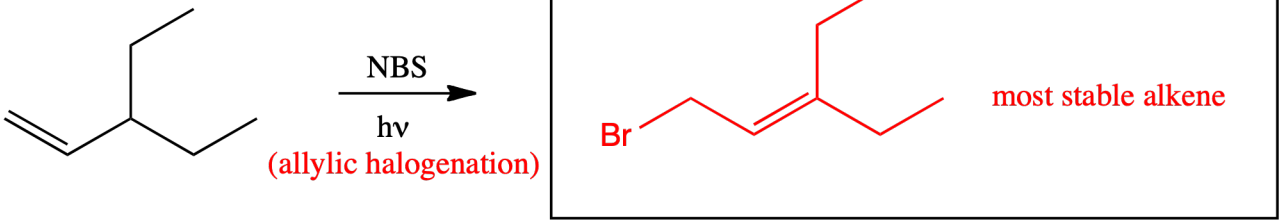


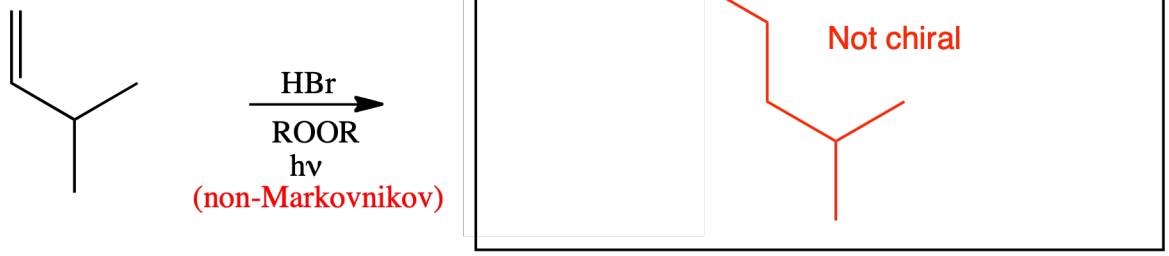



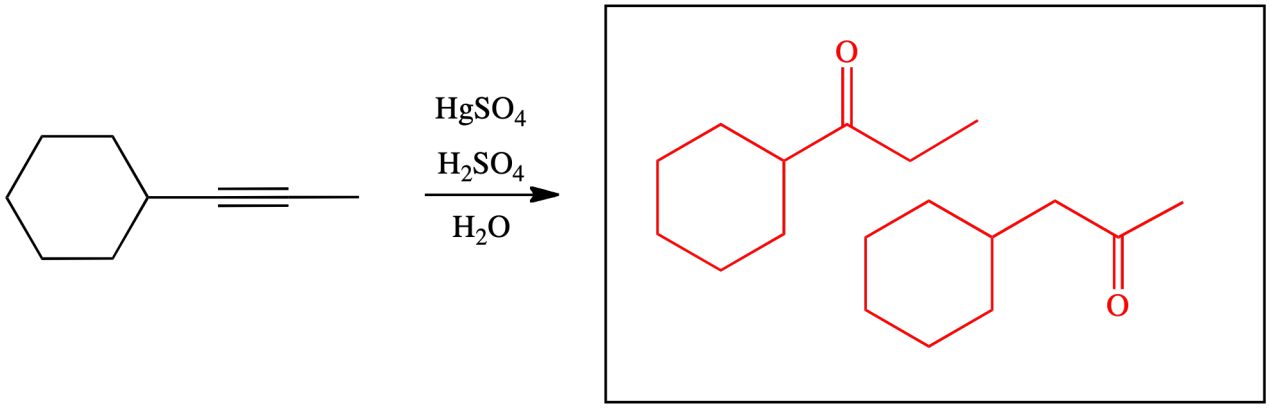



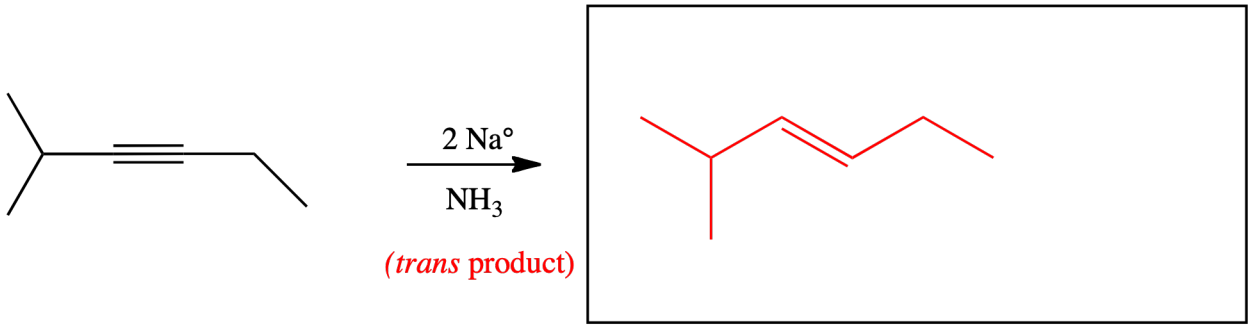



7. For the following, complete the reactions with the predominant product or products. You must indicate stereochemistry with wedges and dashes. If a racemic mixture is created, you must write "racemic" under the structures.

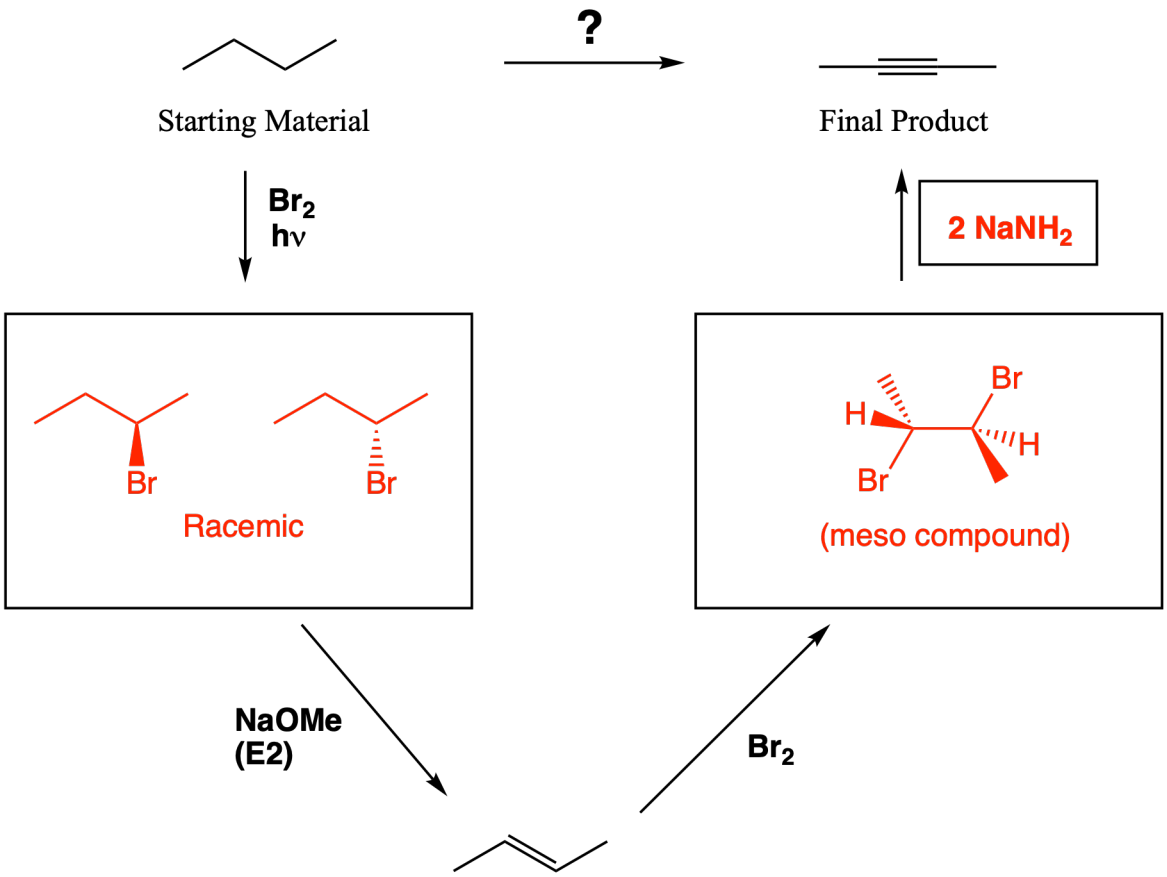


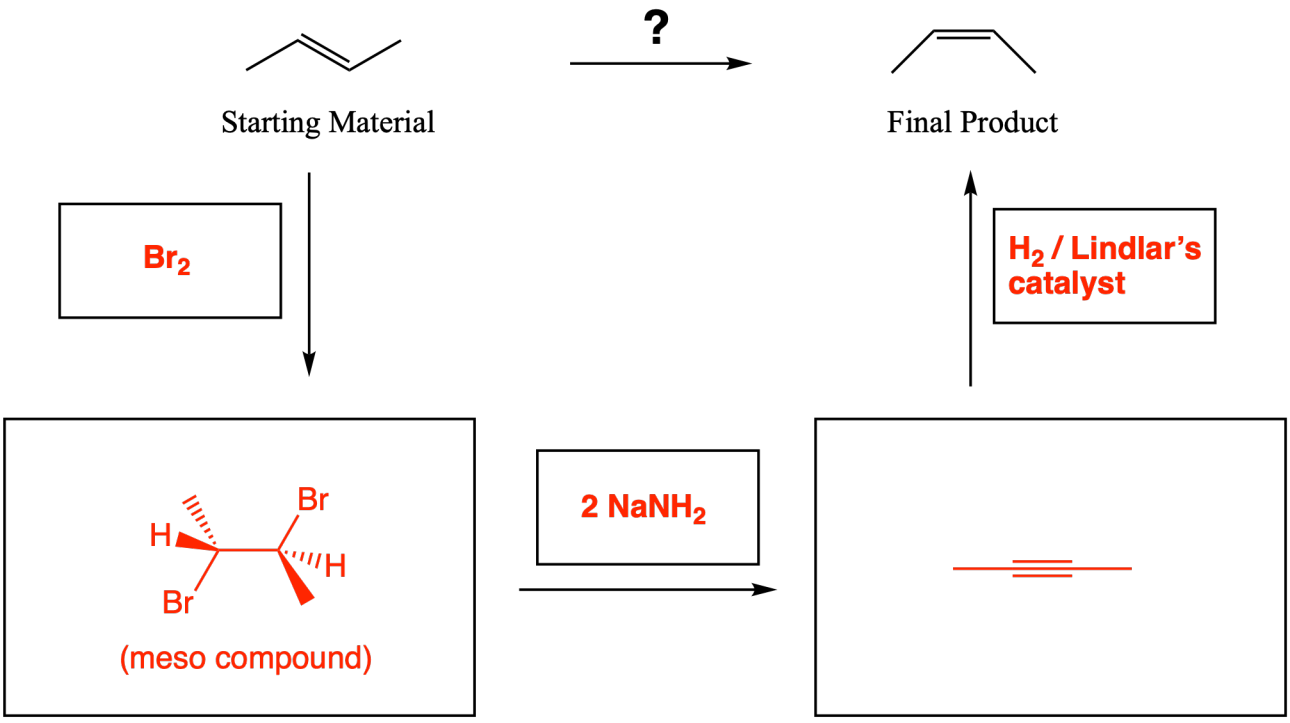



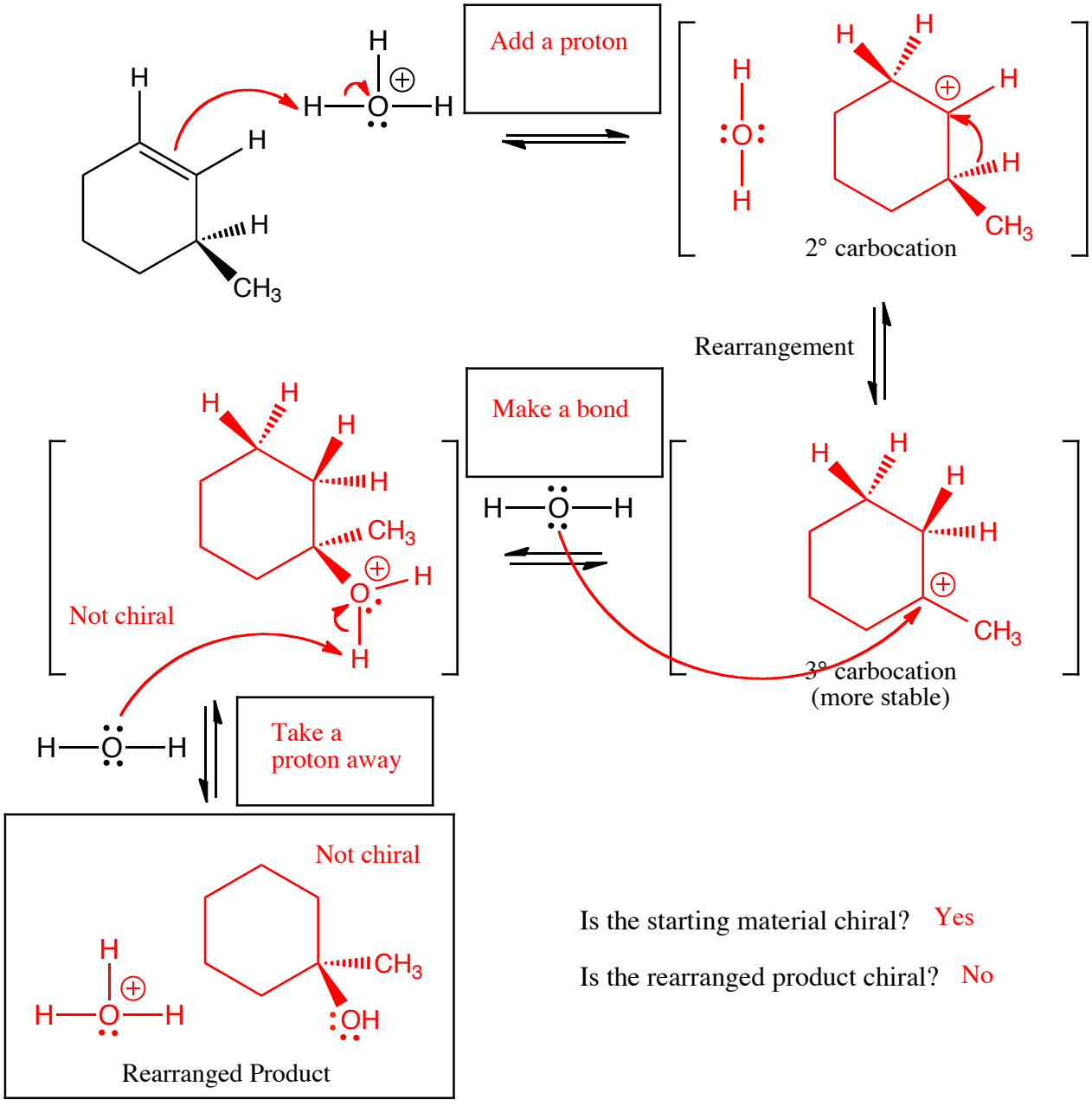
**8. The point of organic chemistry is synthesis**, the conversion of starting molecules into different ones with a new structure and function. Each reaction you are learning should be thought of as a "tool" that allows you to create a desired type of molecule. These tools can be used in an almost infinite number of combinations to create truly interesting molecules. **In the large boxes provided, draw the structures of the molecules indicated in this synthesis scheme. For smaller boxes next to the arrow, write the reagents needed to carry out the appropriate reaction.** You may use any reactions we have learned provided that the product(s) you draw for each step is/are the predominant one(s). Show all the reagents you need. Show each molecule synthesized along the way and be sure to pay attention to the regiochemistry and stereochemistry preferences for each reaction. You must draw all stereoisomers formed, and use wedges and dashes to indicate chirality at each chiral center. Write racemic when appropriate. **All the carbons of the product must come from carbons of the starting material.**



**9. In the large boxes provided, draw the structures of the molecules indicated in this synthesis scheme. For smaller boxes next to the arrow, write the reagents needed to carry out the appropriate reaction.** You may use any reactions we have learned provided that the product(s) you draw for each step is/are the predominant one(s). Show all the reagents you need. Show each molecule synthesized along the way and be sure to pay attention to the regiochemistry and stereochemistry preferences for each reaction. You must draw all stereoisomers formed, and use wedges and dashes to indicate chirality at each chiral center. Write racemic when appropriate. **All the carbons of the product must come from carbons of the starting material.**



**10.** (23 pts.) Read these directions carefully. **For the reaction shown below, fill in the details of the mechanism <u>for the rearranged product only. Although non-rearranged product is also formed, we are not interested in that mechanism.</u> 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.**




Is the starting material chiral? Yes

Is the rearranged product chiral? No