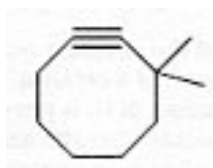
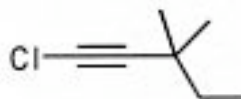
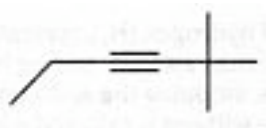


## ORGO/BIO CHAPTER 9 HW

1. Draw the following alkynes.

- 2-butyne
- 4-bromo-2-hexyne
- 3,3-dimethyl-1-butyne
- 2-methyl-3-heptyne
- 1,3-butadiyne (!)
- 4-cyclobutyl-2-pentyne (!)

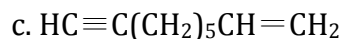
2. Name the following alkynes.



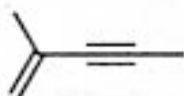
Just for fun: A hydrocarbon containing both a double and triple bond is known as an **alkenyne**. When naming an alkenyne, the chain is numbered starting from the end closest to either of the multiple bonds. When a double bond and a triple bond are at equidistant positions from either terminus, the *double* bond is given the lower number. As an example:

$\text{CH}_3\text{CH}_2\text{CH}=\text{CHC}\equiv\text{CH}$  is called 3-hexen-1-yne (not 3-hexen-5-yne)

3. Name the following alkenynes.



d.

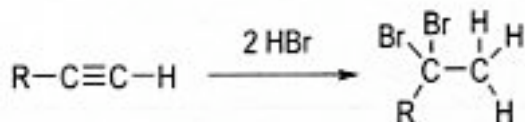
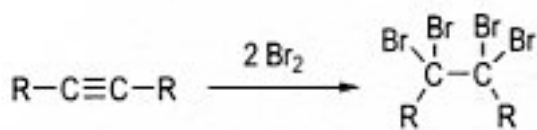


4. Draw the following molecules 4-bromo-3-methyl-3-penten-1-yne.

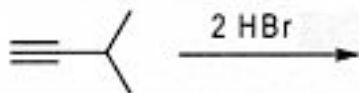
5. Give the structural formulas and IUPAC names of the alkyne isomers with the formula  $\text{C}_6\text{H}_{10}$ .

6. Consider the isomers in question 5 above. Which one is optically active (has a chiral center)?

Remember the addition reactions of alkenes? The halogen and hydrohalic addition reactions of alkynes are similar, complete with Markonikov's rule. Woohoo! Here are two general examples:



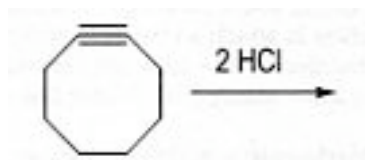
7. Predict the product of the following reaction. Then draw the mechanism of the reaction using arrow pushing.



8. Predict the product of the following reaction. Then draw the mechanism of the reaction using arrow pushing.



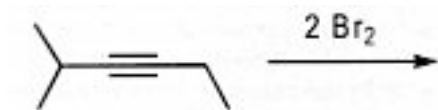
9. Predict the product of the following reaction. Then draw the mechanism of the reaction using arrow pushing.



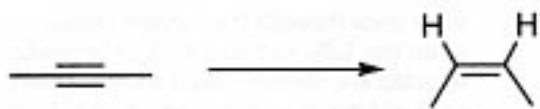
10. Predict the product of the following reaction.



11. Predict the product of the following reaction.



12. Hello partial hydrogenation! Predict the reactant that was required, in addition to a catalyst, to complete the following reaction. Also, name the reactant and product shown in the reaction.



13. Use structural formulas, or line bond structures, to illustrate the *complete* hydrogenation of 2-hexyne. Name the product of this reaction. No mechanism necessary.

