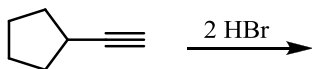
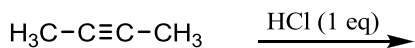


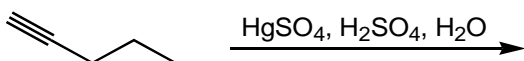
The  $\pi$  bonds of alkenes and alkynes tend to act as nucleophiles in chemical reactions. In this worksheet you will focus on typical electrophilic addition reactions of alkynes. (NOTE: Not all instructors cover every one of these reactions.)

1. a) Draw out the products for the following hydrogen halide addition reactions. b) Do these reactions involve rearrangements? c) What are the stereochemical and regiochemical factors you must remember when performing these reactions?



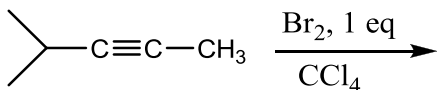
- d) How would you change the conditions of the reaction to get the anti-Markovnikov product in the second reaction above?

2. a) Draw out the products for the following acid-catalyzed water addition reaction. b) Does this reaction involve rearrangements? c) What are the stereochemical and regiochemical factors you must remember when performing this reaction?

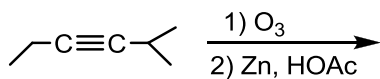


- d) What would you do differently if you wanted to form an aldehyde product?

3. a) Draw out the products for the following halogen addition reactions. b) Do these reactions involve rearrangements? c) What are the stereochemical and regiochemical factors you must remember when performing these reactions?



4. a) Draw out the products for the following oxidative cleavage reactions. b) What are the important factors you must remember when performing these reactions?



**Putting it all together:** Fill in the missing parts for the following reactions. Provide the starting material(s), reagent(s), or major product(s) needed to complete each reaction. Include necessary stereochemistry or numbered steps where needed.

