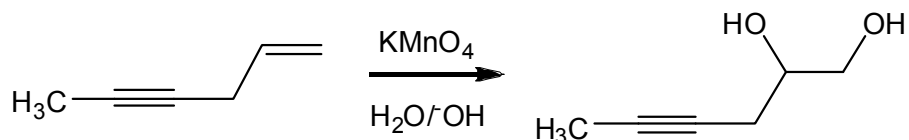
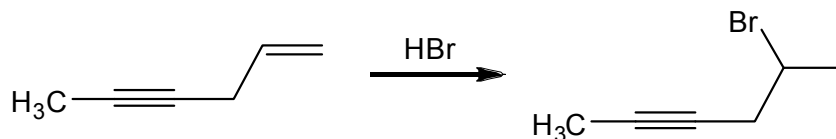
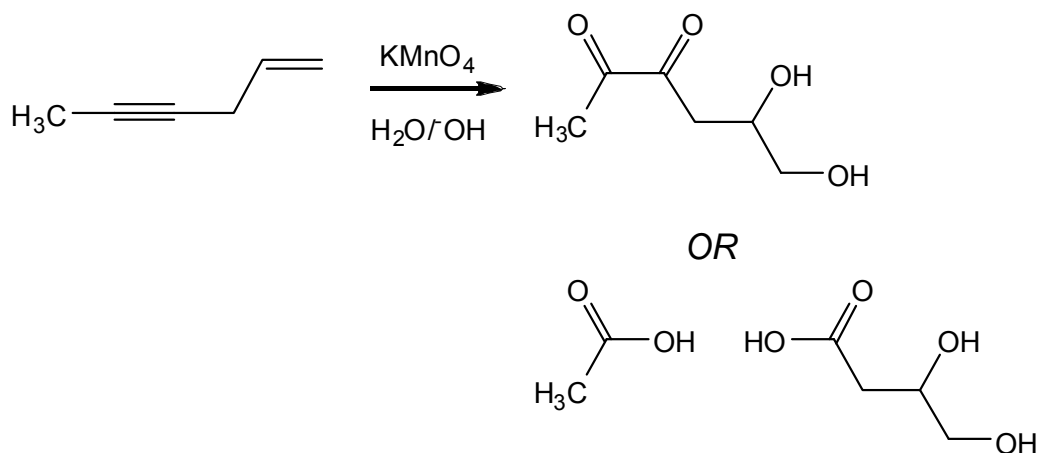


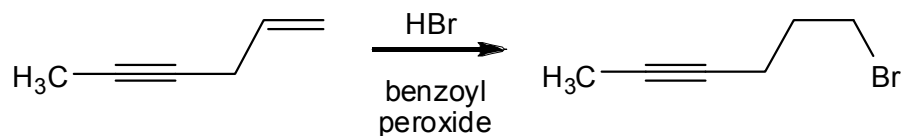
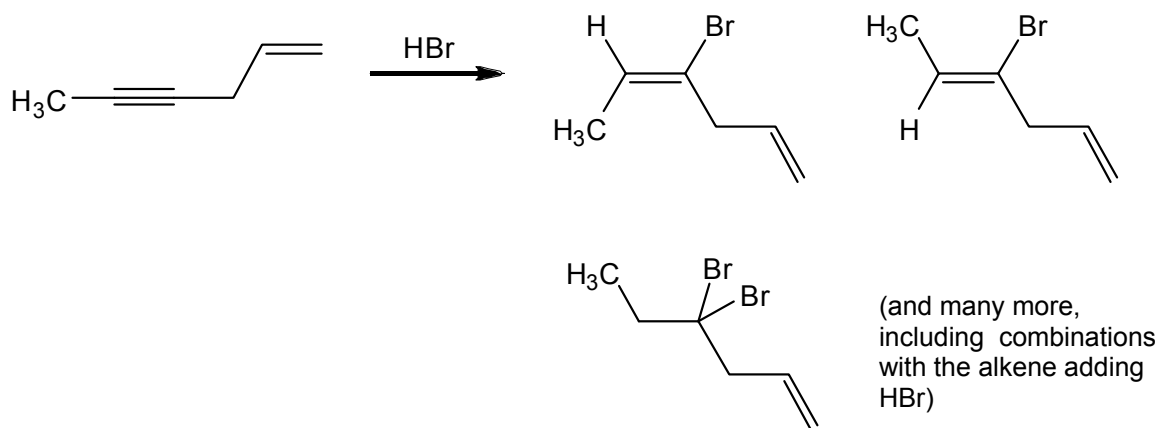
**Workshop 20 Solutions**  
**Interfering Functional Groups**



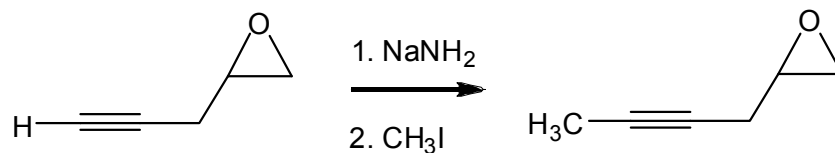
$\text{KMnO}_4$  will react with the alkyne too. It's not clear how far the alkyne will be oxidized; milder conditions than these (pH 7) would take it to the diketone, but heat (not present here) would cleave the triple bond into carboxylic acids.



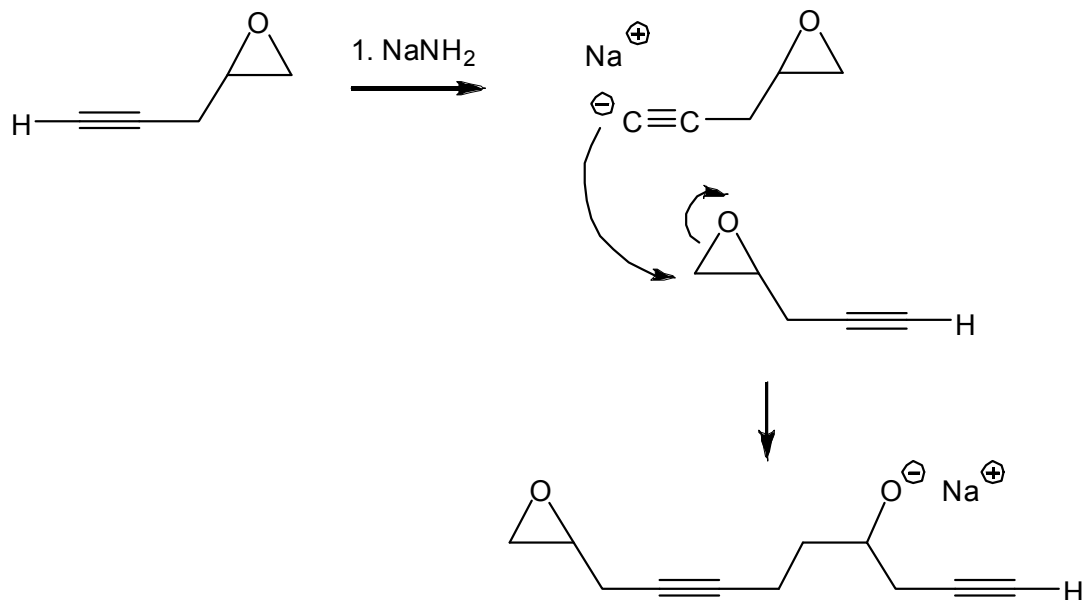
$\text{HBr}$  will add Markovnikov to the alkyne, just like it will to the alkene. The recipe doesn't say how many equivalents of  $\text{HBr}$  were added, but in principle, any number of  $\text{HBr}$  molecules could add to the starting material:



Same as above. Alkyne is internal, so it doesn't matter whether addition is Markovnikov or anti-Markovnikov.

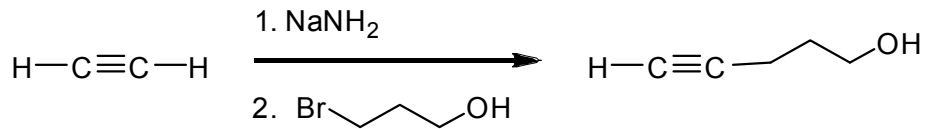


The problem here is that the molecule will react with itself—or, more accurately, as soon as alkynyl ions are generated, they will immediately react with other molecules of the same type:

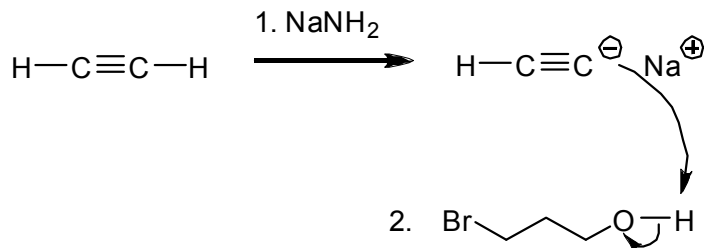


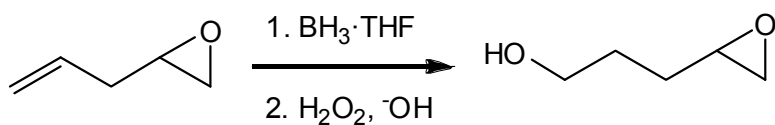
The anion never gets the chance to react with  $\text{CH}_3\text{I}$ . Take-home message: avoid creating synthetic intermediates that will react with themselves.

---

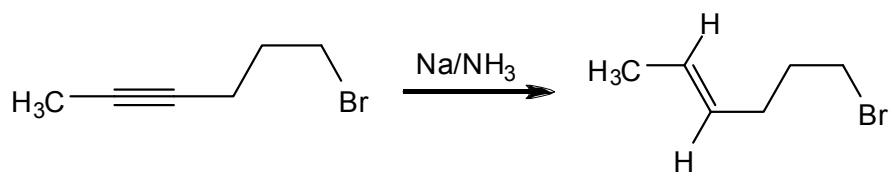
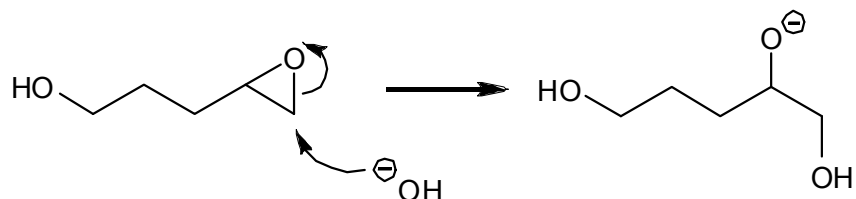


Here, the problem is that the alkynyl anion would more rapidly deprotonate the alcohol than it would do  $\text{S}_{\text{N}}2$  on the halide—because acid-base reactions are extremely rapid, and the alcohol is a stronger acid ( $\text{pK}_{\text{a}} \approx 16$ ) than the alkyne ( $\text{pK}_{\text{a}} \approx 25$ ).





I'm sure the hydroboration will succeed, but the  $\text{OH}^-$  in the second step could not only help convert the borane into the alcohol, but it could also open the epoxide:



Amines are great nucleophiles, and because this reaction is run in liquid ammonia (condensed amine), there would be no way to stop the ammonia from attacking the bromide:

