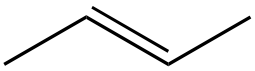
Alkynes #1: Reactions and Practicing Keto-Enol Tautomerism

Well gang, here we are: Only 2 more worksheets left in O Chem 1. Give yourself a second to pat yourself on the back (or if someone's watching, make a mental note to do it later ☺). You've worked really hard up until now. But we have to finish strong.

This worksheet is meant to rehash the reactions of alkynes that we discussed recently. Also, I'll have you briefly flex your mechanism muscles and show me how Keto-Enol Tautomerism works. So let's get it ☺.

1.) First up, complete the rxn questions:

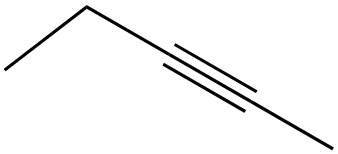


1.) Br_2 , CCl_4

2.) 2 equiv $NaNH_2$

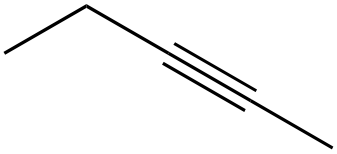
1.) LDA

2.) CH_3Br



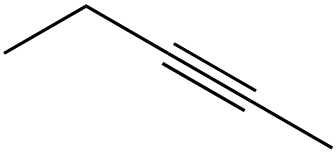
H_2

Pd-C (2 equiv)



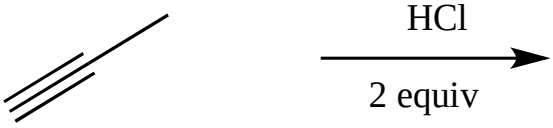
NH_3 (l)

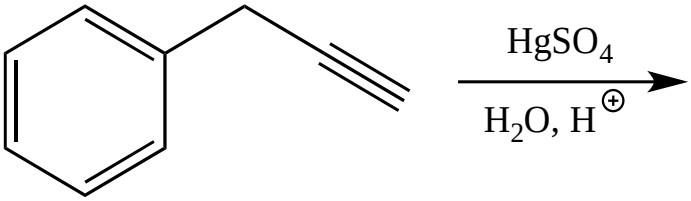
Na^o

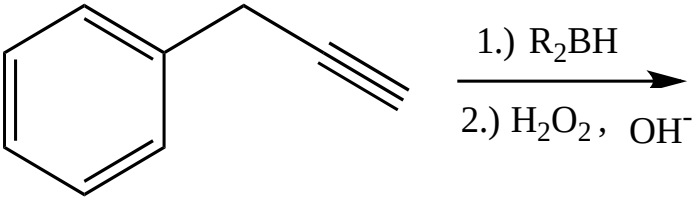


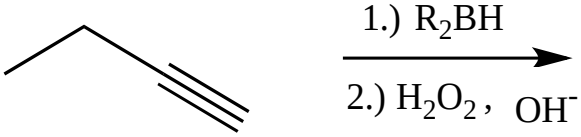
H_2

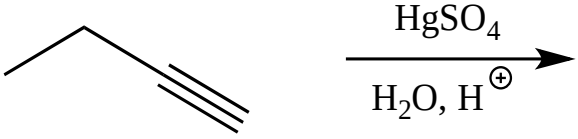
Lindlar's

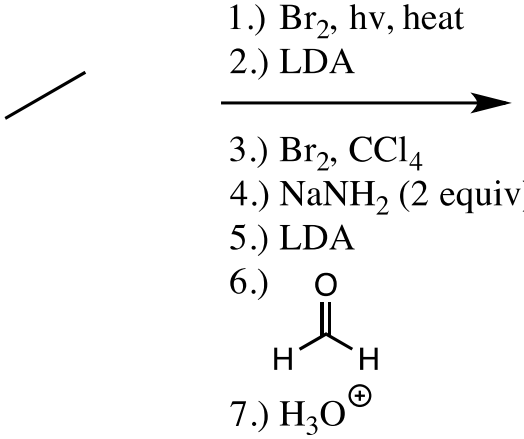

HCl
2 equiv


HgSO4
H2O, H⊕

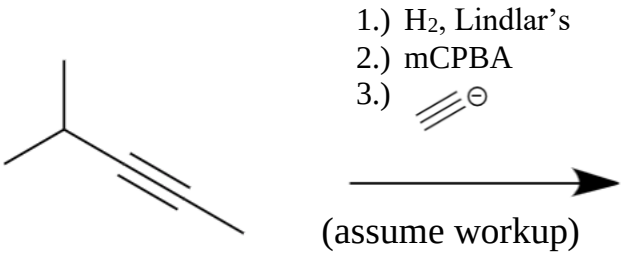

1.) R2BH
2.) H2O2, OH-

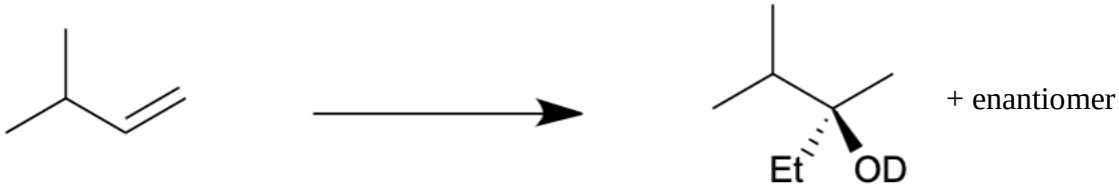

1.) R2BH
2.) H2O2, OH-

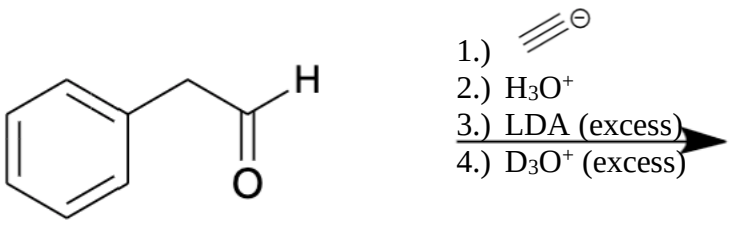

HgSO4
H2O, H⊕

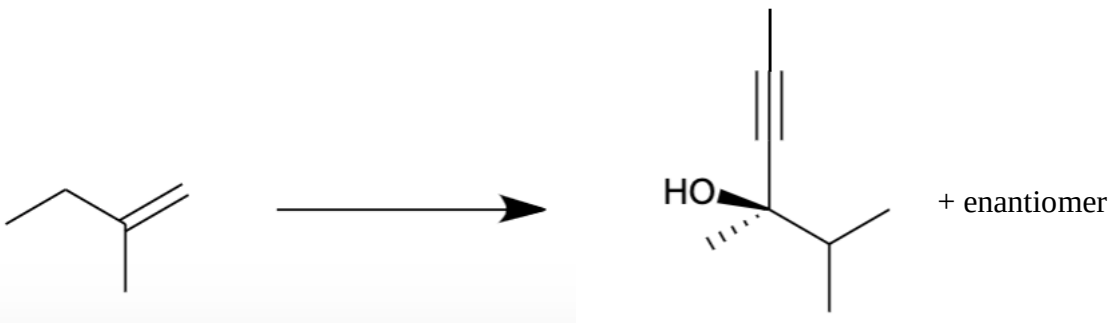

1.) Br2, hv, heat
2.) LDA
3.) Br2, CCl4
4.) NaNH2 (2 equiv)
5.) LDA
6.)
O
H
H
7.) H3O⊕

2.) Ok, with some basic practice down, let's kick it up a notch.

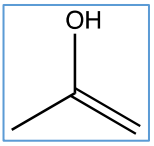






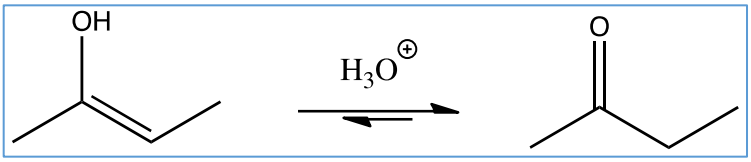


3.) Alright, alright, alright, good job. Last few problems, and then this worksheet is ovaaaa. So remember when we discussed the mechanism for the Hydration of an alkyne (whether it was the anti addition or the regular addition), we encountered an intermediate functional group we called an Enol (here's a quick example of a 3 carbon Enol):



Well, we know we don't see an enol in the product: Rather, we see a ketone/aldehyde. And that's due to the Keto-Enol Tautomerism equilibrium we discussed. To finish this worksheet up, I need you guys and gals to show me this Tautomerism mechanistically:

a.) Draw the curved arrow mechanism to show the tautomerization of the Enol form of the molecule below to its Keto form.



b.) Now, time for role reversal: Draw the curved arrow mechanism to show the tautomerization of the Keto form of the molecule below to its Enol form.

Remember that the **Keto form is favored, but I want to make sure you guys can work forwards and backwards with this mechanism.**