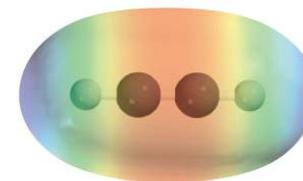
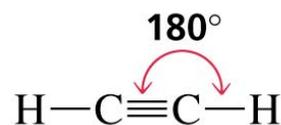
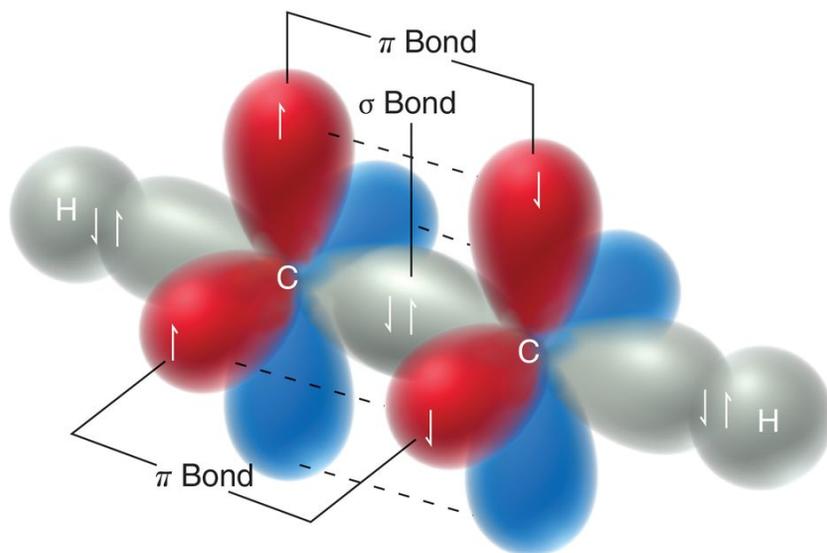


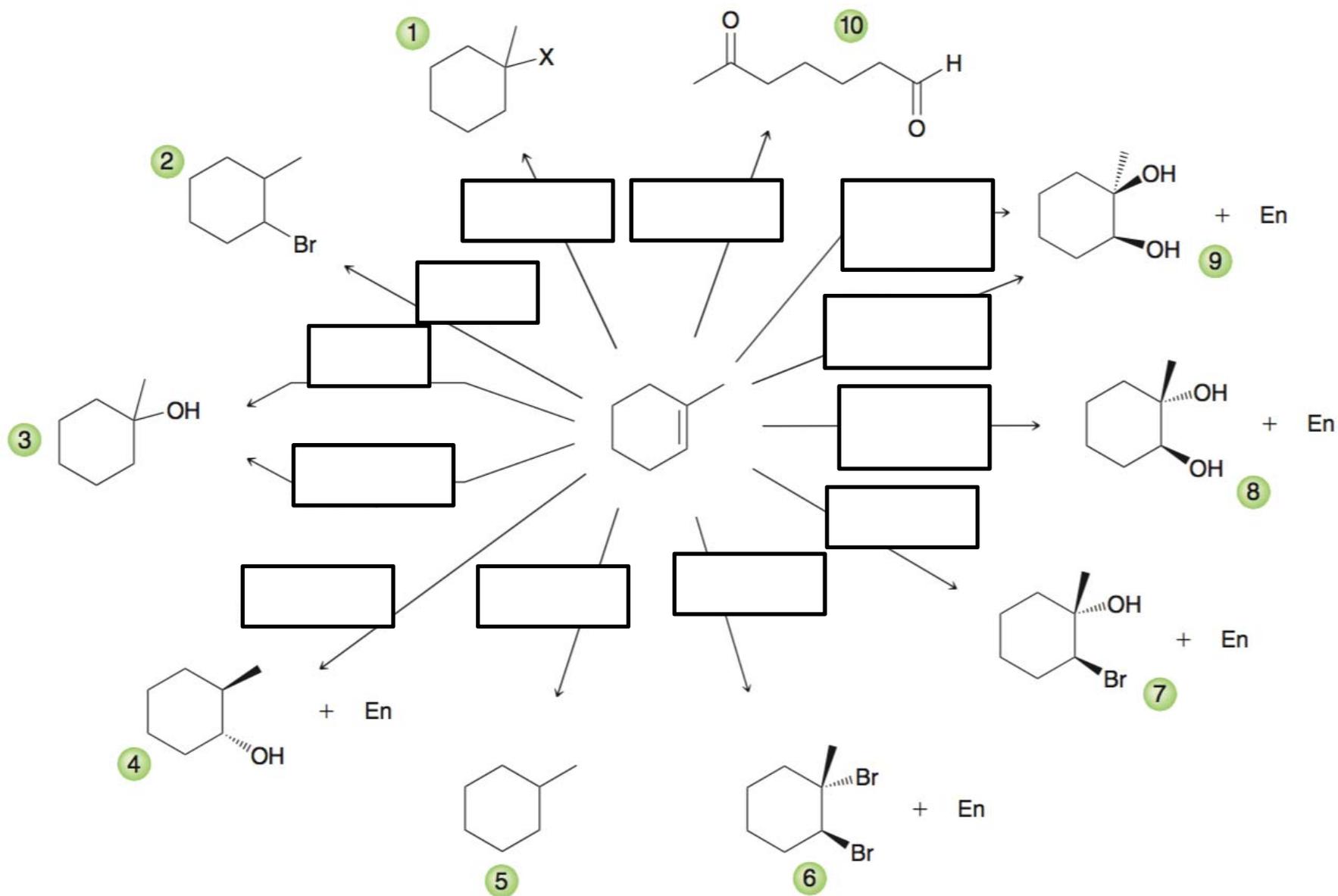
# Chapter 9:

## Alkynes and Reactions with Alkynes

- Today (9.1-9.4) Reactions with Alkynes
- Wednesday (9.4-9.8) Reactions with Alkynes
- Friday Finish Chapter 9 (9.8-9.11)

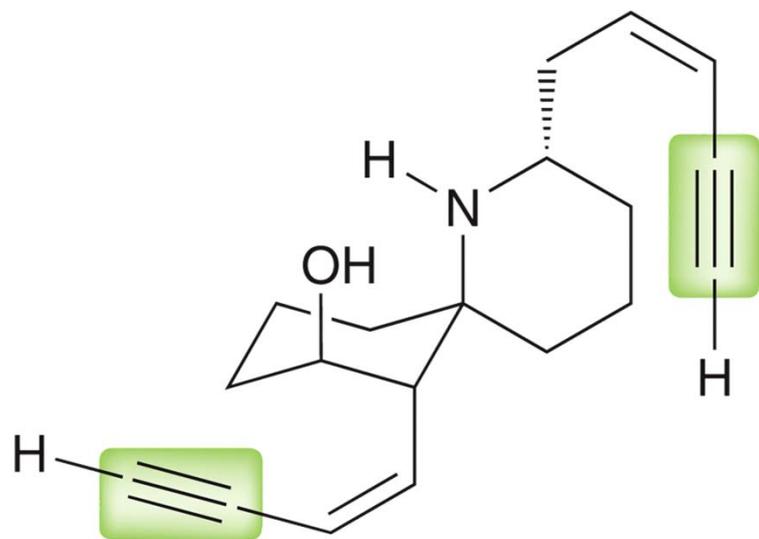


# Electrophilic Addition Reactions:

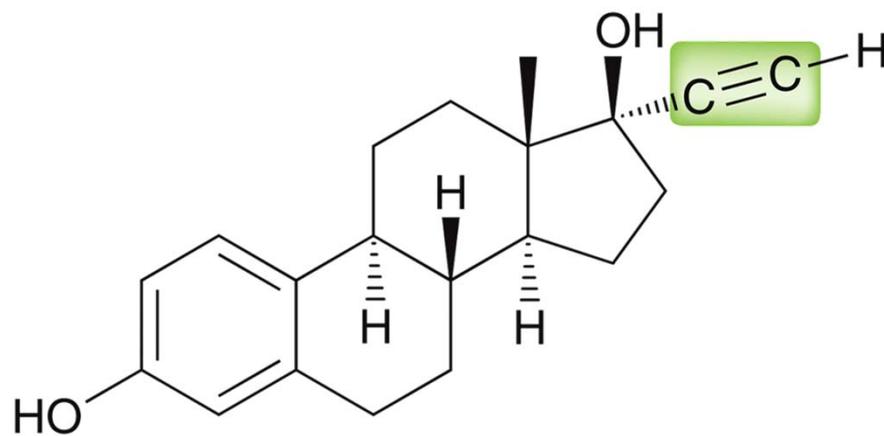


# Alkynes in Industry and Nature

- Acetylene is the simplest alkyne
- It is used in blow torches and as a precursor for the synthesis of more complex alkynes
- More than 1000 different alkyne natural products have been isolated

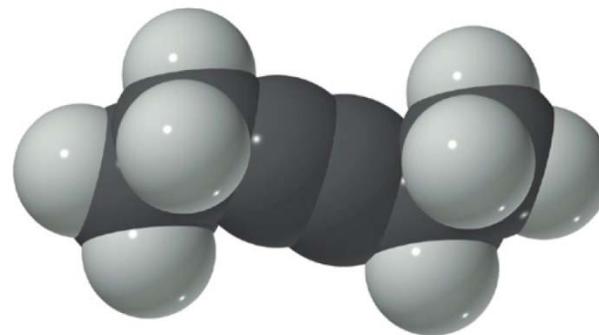
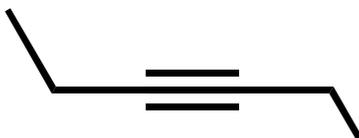
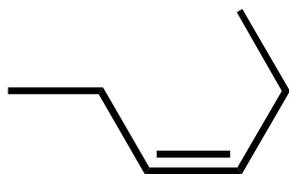
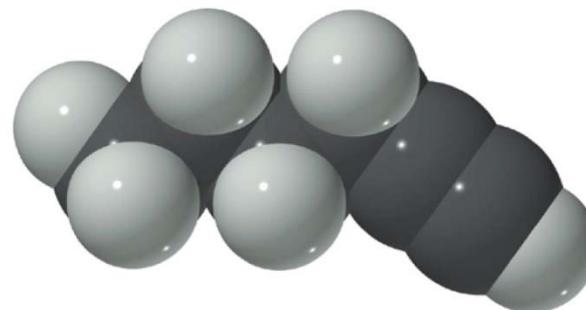
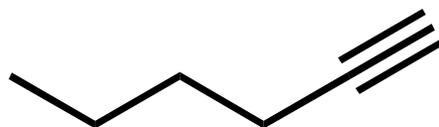


Histrionicotoxin

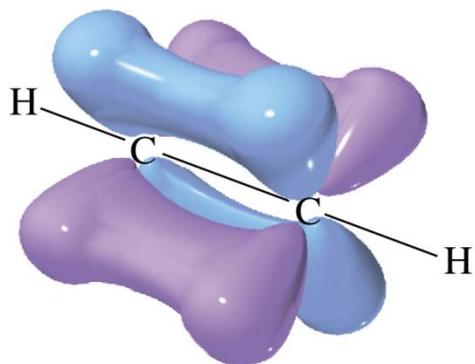
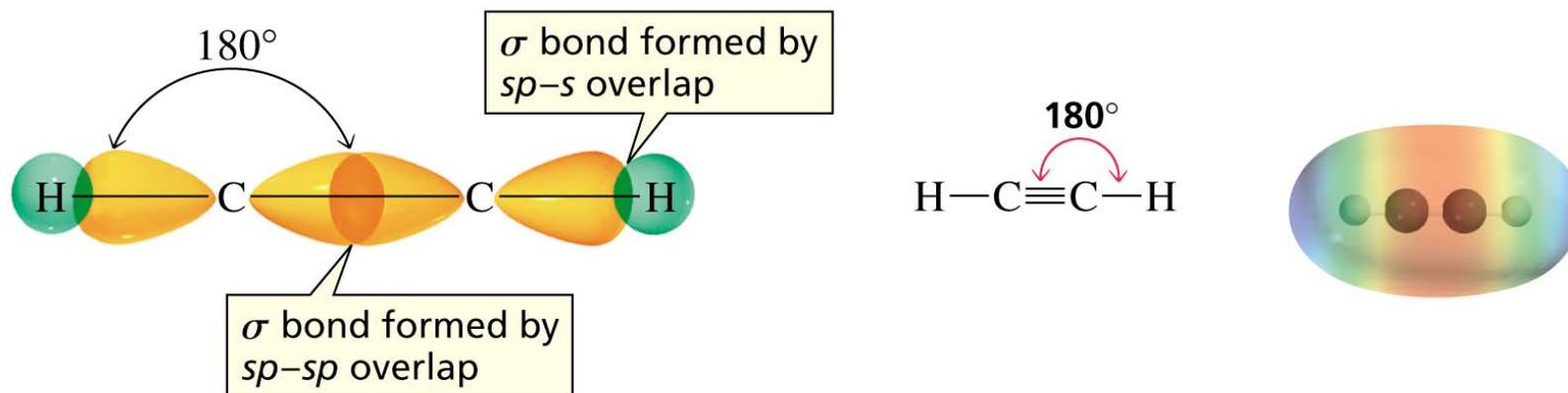


Ethynylestradiol

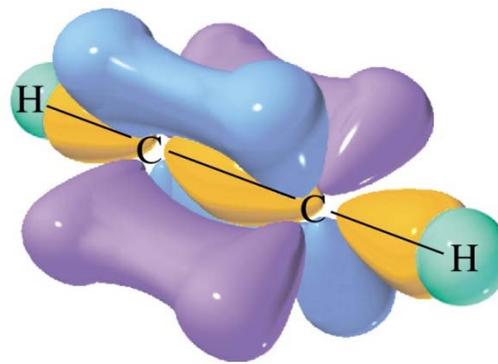
Ch. 9 - **Alkynes** –  
hydrocarbons that contain a carbon–carbon triple bond



# The Structure of Alkynes



(a)



(b)

# Nomenclature

In common nomenclature, alkynes are named as substituted acetylenes



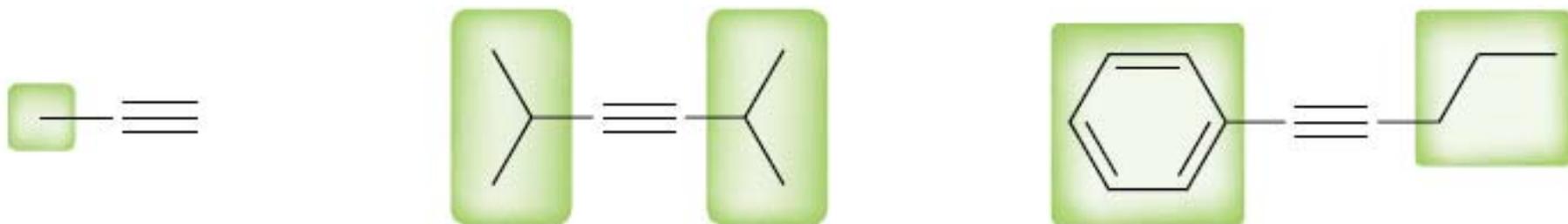
Systematic:

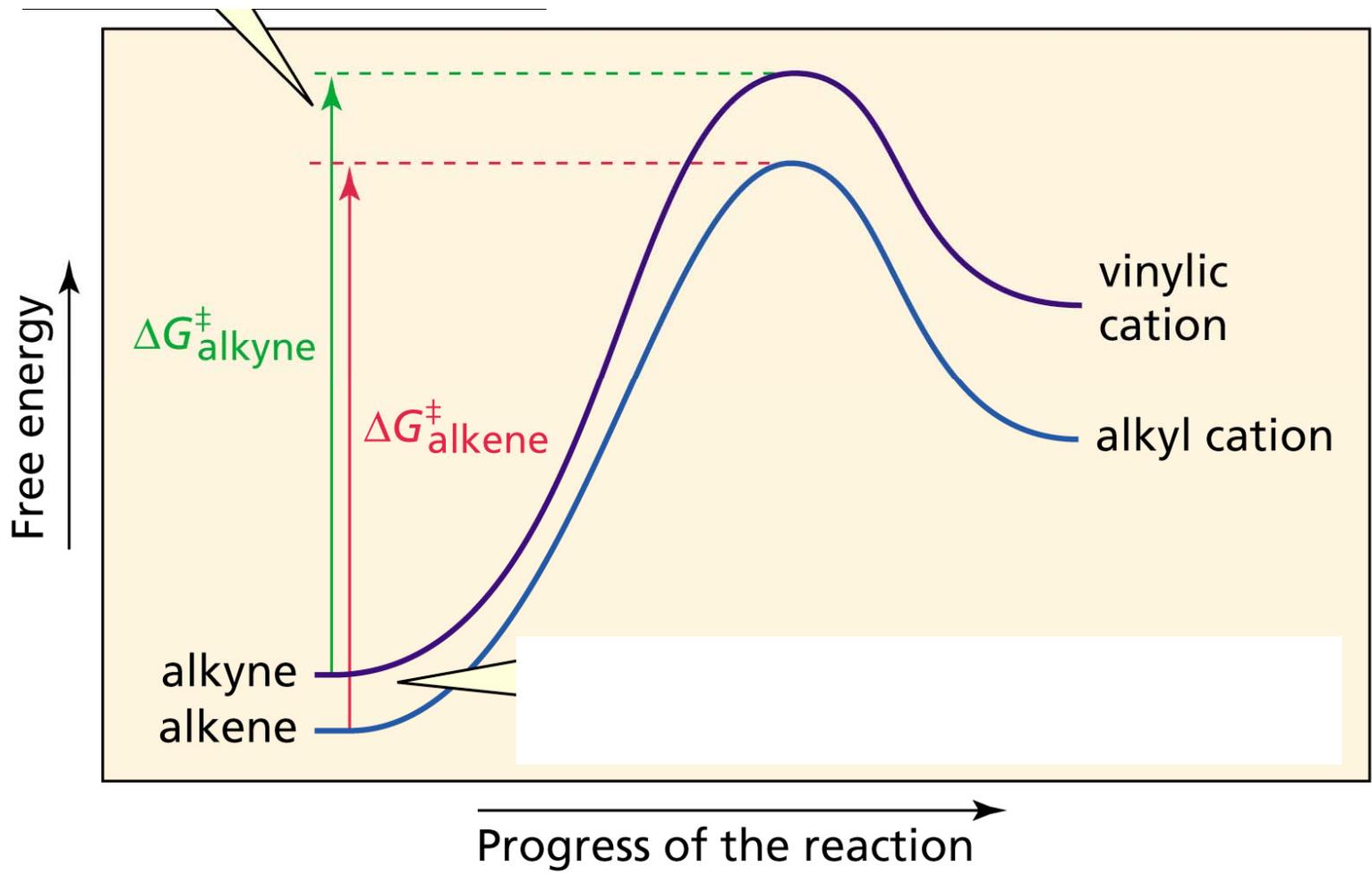
Common:



# Alkyne Nomenclature

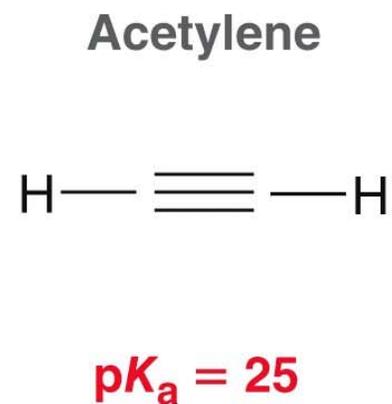
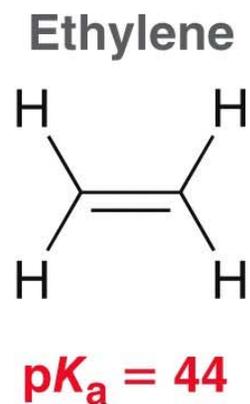
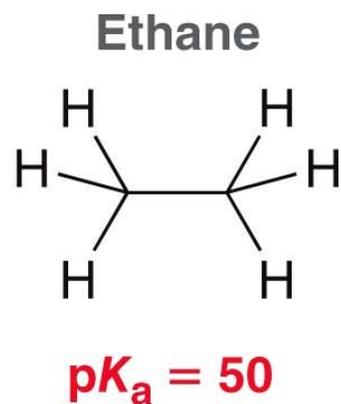
- In addition to the IUCAP naming system, chemists often use common names that are derived from the common parent name acetylene.





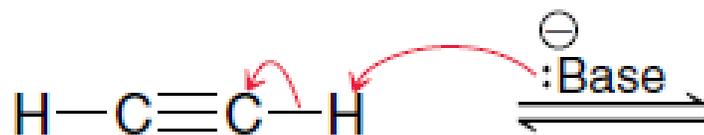
# Acidity of Alkynes

- Recall



# Alkyne Acidity

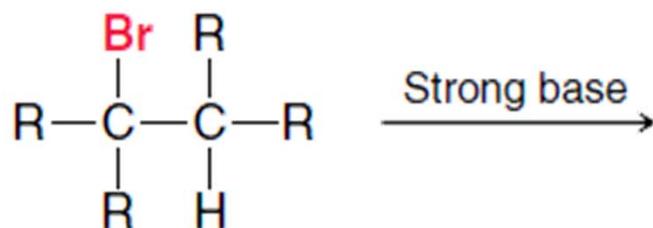
- Because acetylene ( $pK_a=25$ ) is still much weaker than water ( $pK_a=15.7$ ), a REALLY!! strong base is needed to make it react.



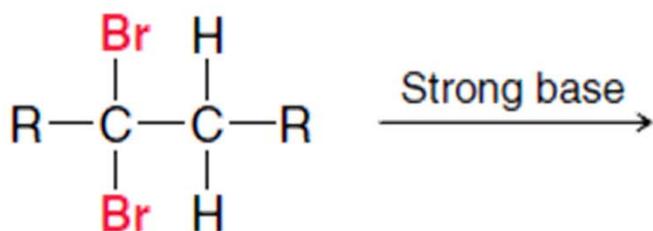
Acetylene

# Preparation of Alkynes

- Like alkenes, alkynes can also be prepared by elimination.



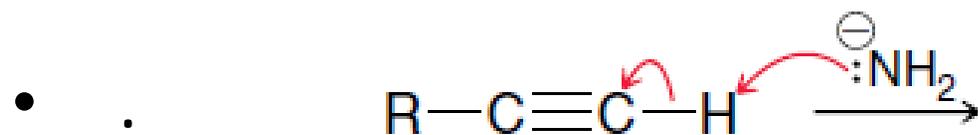
An alkyl halide



An alkyl dihalide

# Alkylation of Terminal Alkynes

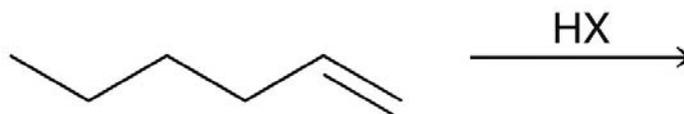
- As acids, terminal alkynes are quite weak.



# Hydrohalogenation of Alkynes

- **Hydrohalogenation** affords Markovnikov addition of **H and X** to an alkyne, same as with an alkene.

addition to an alkene



•

# Addition of Hydrogen Halides

In the presence of 1 mole equivalent of HBr ->



# Hydrohalogenation of Alkynes

# For Next Time....

Suggested Homework Problems Chapter 9

# 1,7,9,13,18,20,32-37, 41,44,52,57