

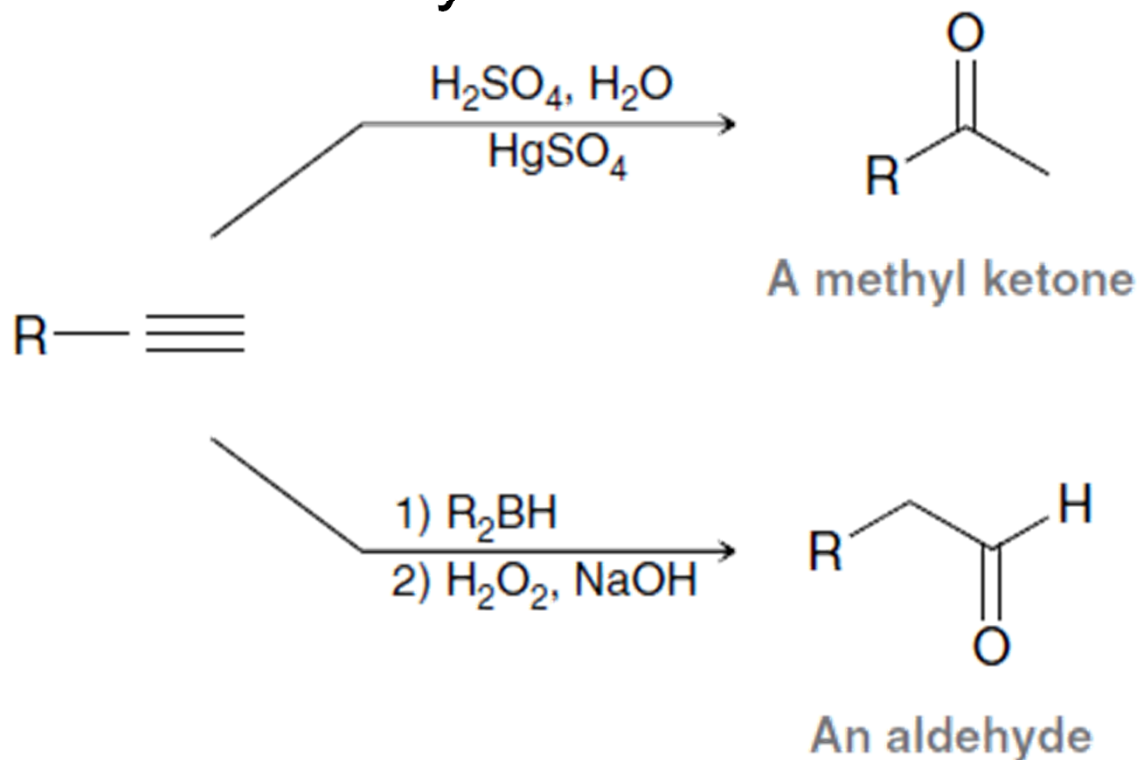
Chapter 9:

Alkynes and Reactions with Alkynes

- Today (End Chapter 9)
 - ✓ Acetylide Formation
 - ✓ Hydrohalogenation
 - ✓ Anti Markovnikov Hydrohalogenation
 - ✓ Preparation of Alkynes
 - ✓ Addition of Halogens (Dibromination)
 - ✓ Reduction of Alkynes (Hydrogenation)
- Acid Catalyzed Addition of Water
- Hydroboration/Oxidation

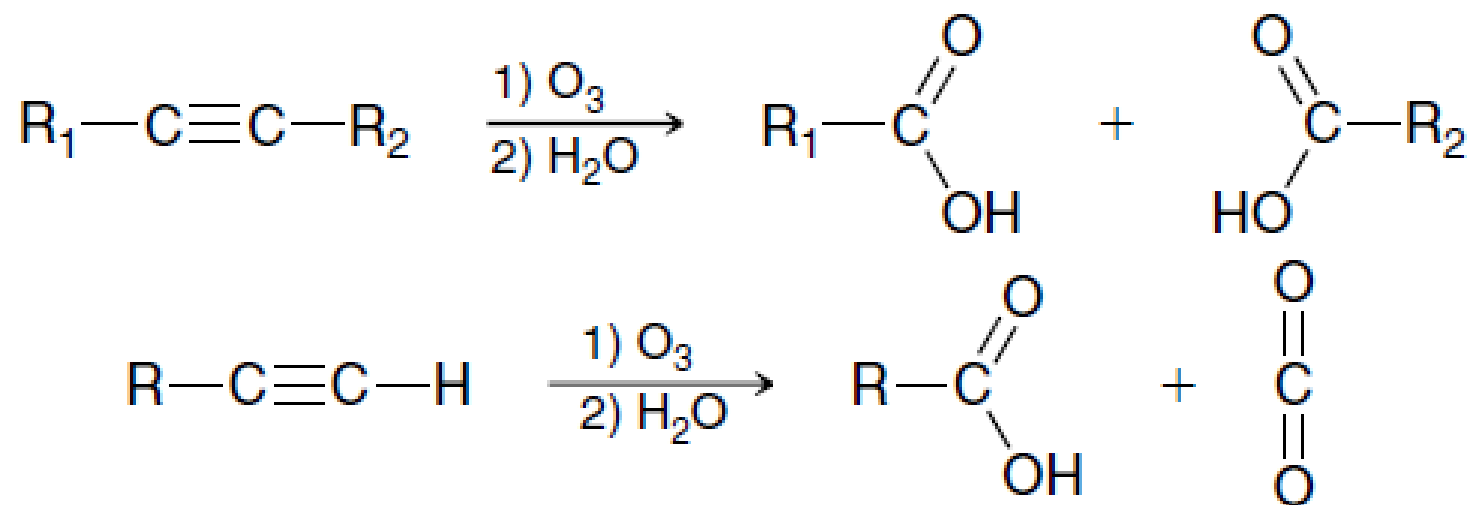
Hydration Regioselectivity

- Markovnikov hydration leads to a ketone.
- Anti-Markovnikov hydration leads to an aldehyde.



Alkyne Ozonolysis

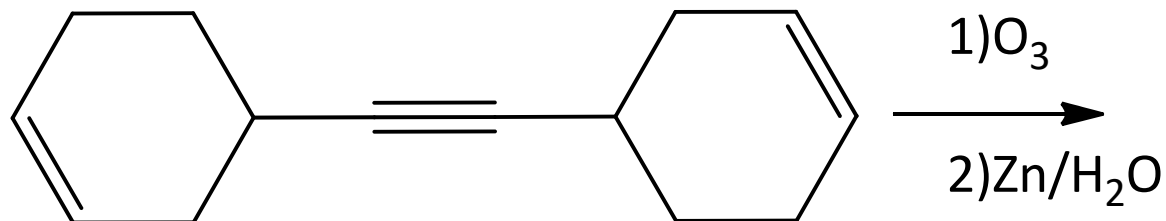
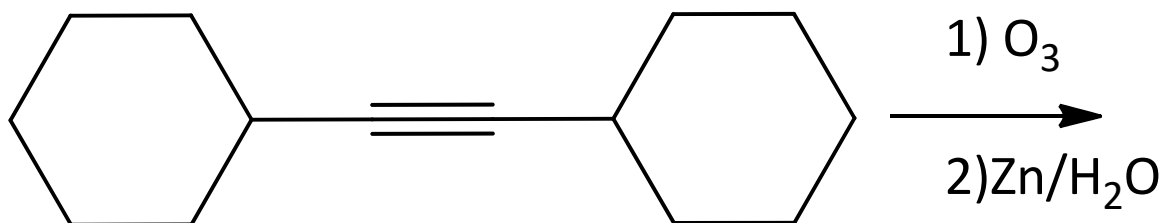
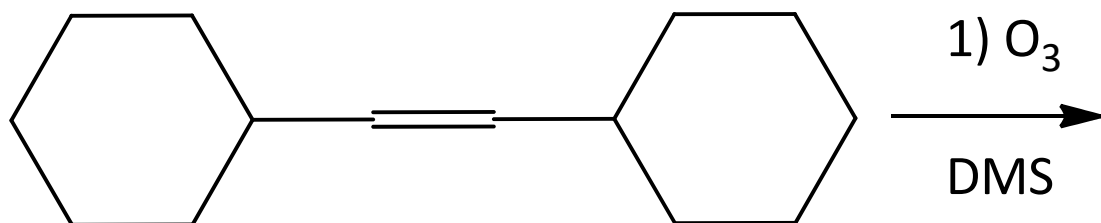
- When alkynes react under ozonolysis conditions, the pi system is completely broken.



- The molecule is cleaved, and the alkyne carbons are fully oxidized.

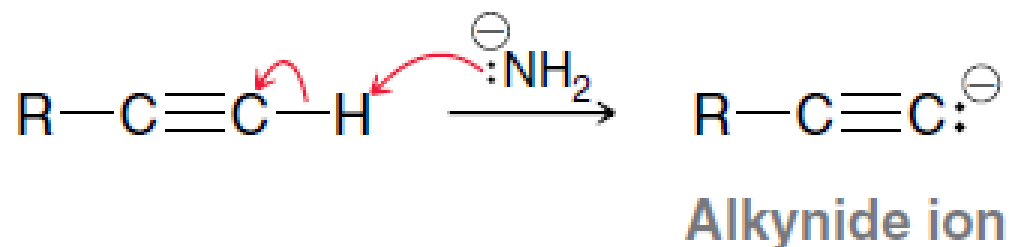
Alkyne Ozonolysis

- Predict the product(s) for the following reactions.

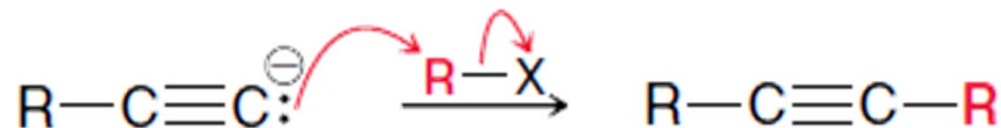


Alkylation of Terminal Alkynes

- As acids, terminal alkynes are quite weak.
- With a VERY strong base, a terminal alkyne can be deprotonated and converted into a good nucleophile.

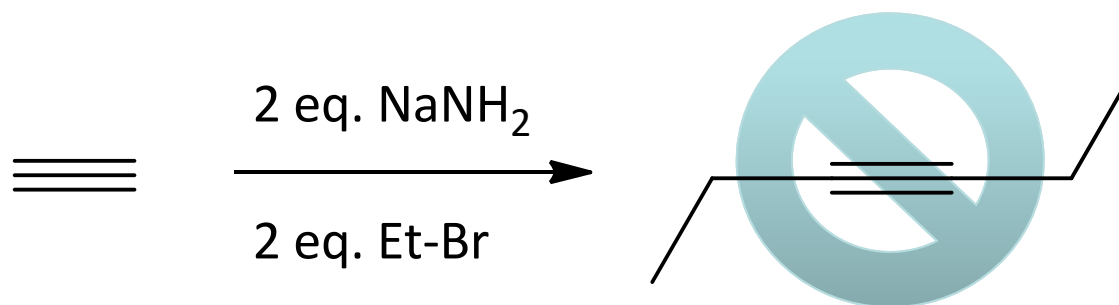
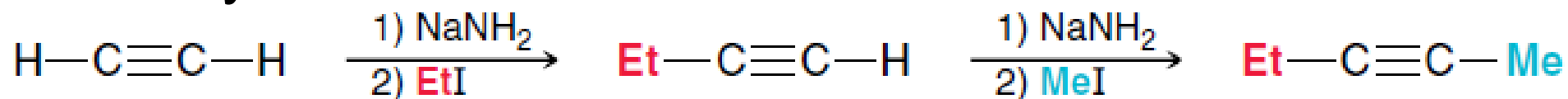


- The alkynide ion can attack a methyl or 1° alkyl halide electrophile.



Alkylation of Terminal Alkynes

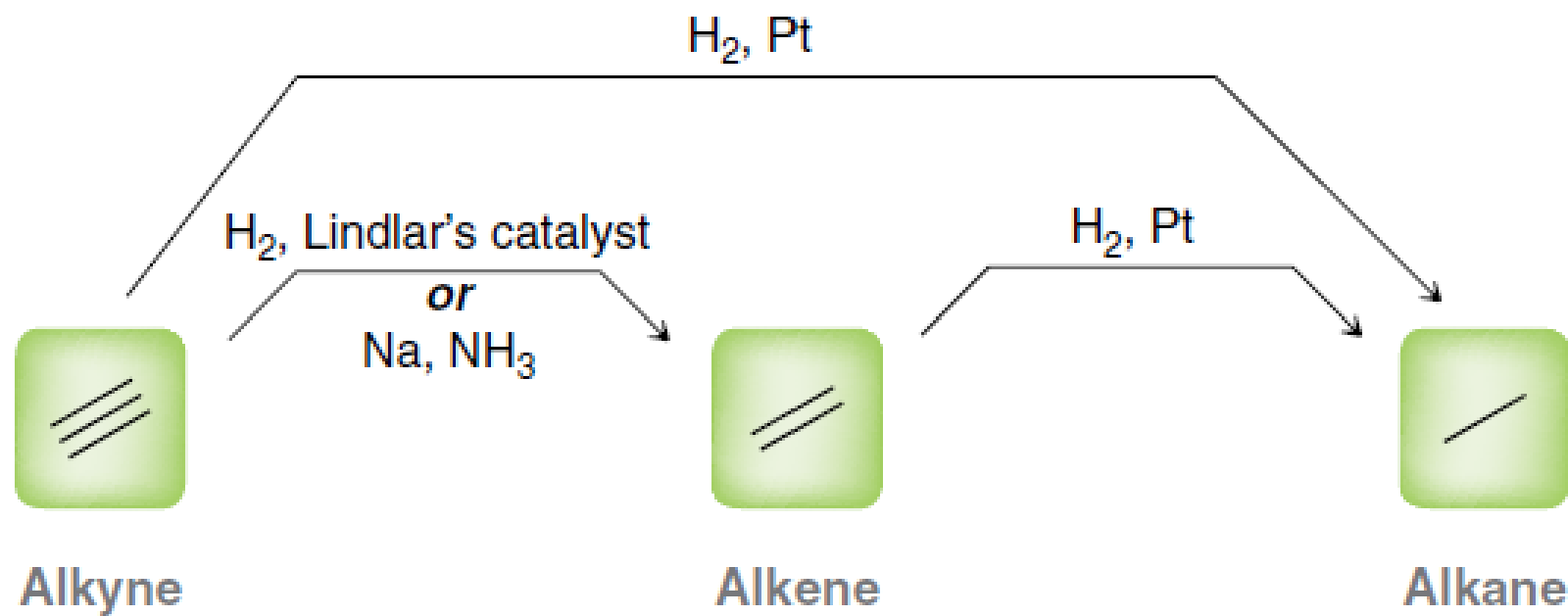
- Acetylene can be used to perform a double alkylation.



- Complex target molecules can be made by building a carbon skeleton and converting functional groups.

Synthetic Strategies

- Recall the methods for increasing the saturation of alkenes and alkynes.

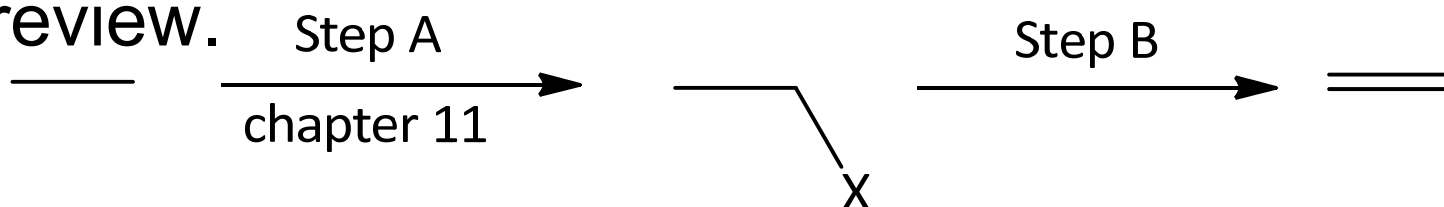


Synthetic Strategies

- Halogenation of an alkene followed by two dehydrohalogenation reactions can decrease saturation.



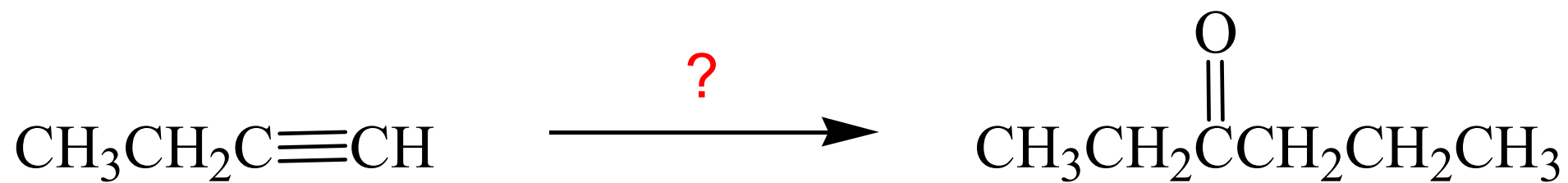
- We will have to wait until Chapter 10 to see how to convert an alkane into an alkene, but here is a preview.



- What conditions would you use in step B?

Designing a Synthesis

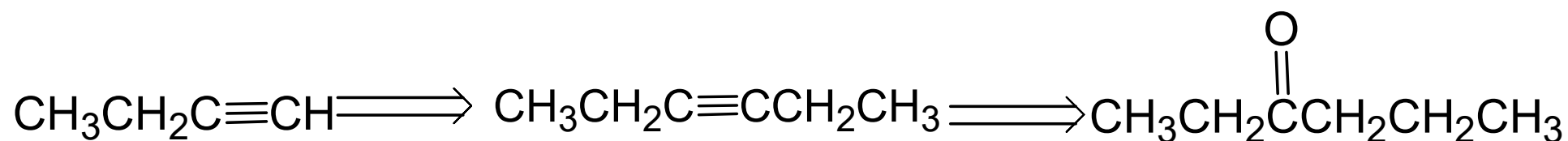
Example 1



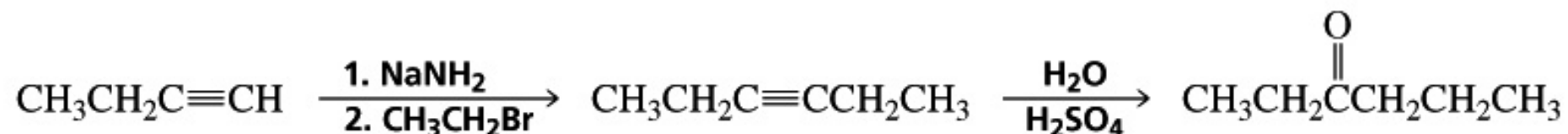
Strategy for a Successful Synthesis

1. Know the Reactions.
2. Analyze the Carbon Skeletons.
3. Analyze the Functional Groups.
4. Work Backwards. (Retrosynthesis)
5. Check your work.

Retrosynthesis



synthesis



For Next Time....

Suggested Homework Problems Chapter 9

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

MONDAY Chapter 10 (10.1-10.4)