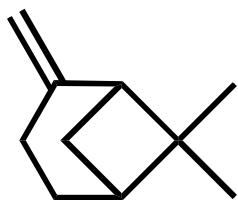
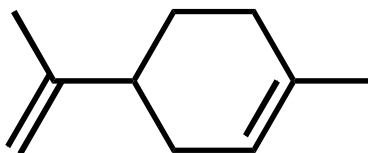


# Ch. 7: Part 3 Alkenes

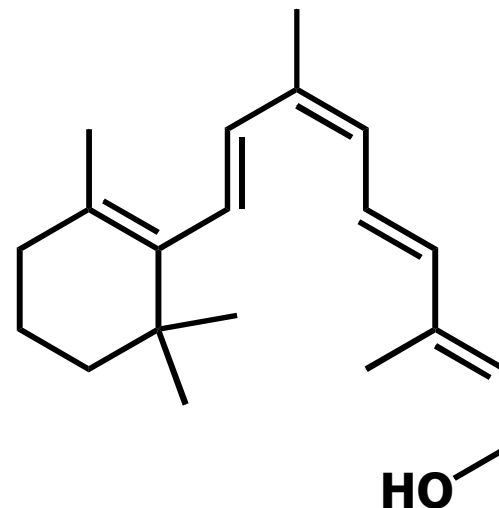
## Structure and Formation



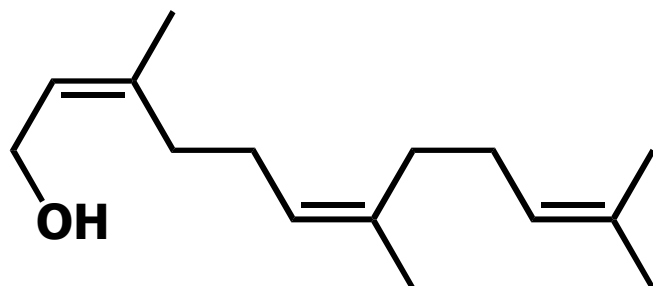
**pinene**



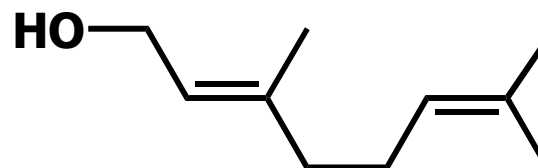
**limonene**



**retinol**



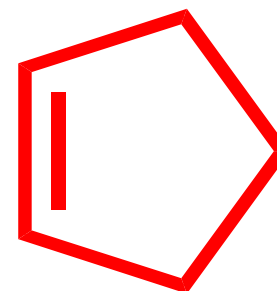
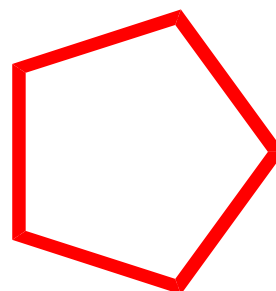
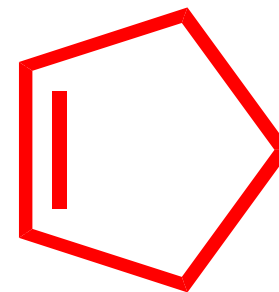
**farnesol**



**geraniol**



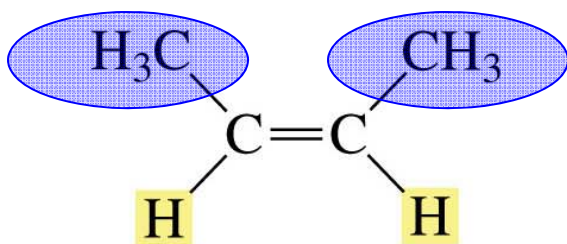
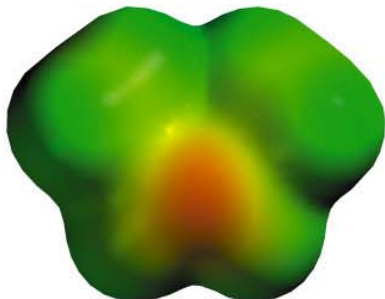
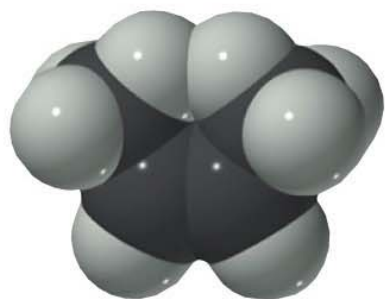
# Molecular Formula of an Alkene



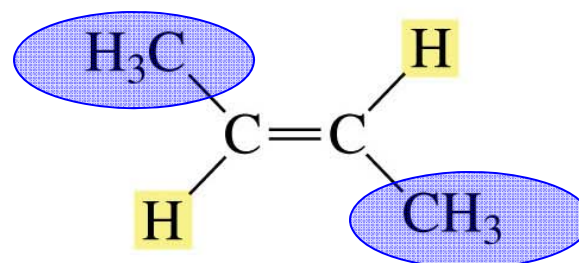
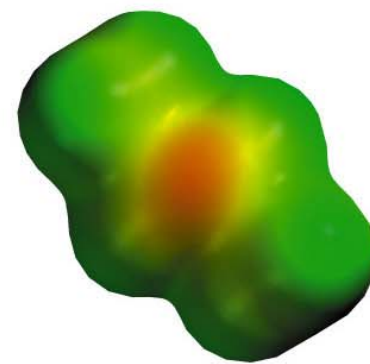
► \_\_\_\_\_ indicates that there are fewer hydrogens attached to carbon than in an alkane.



# Isomers of Alkene



Cis-2-butene  
Bp~4C

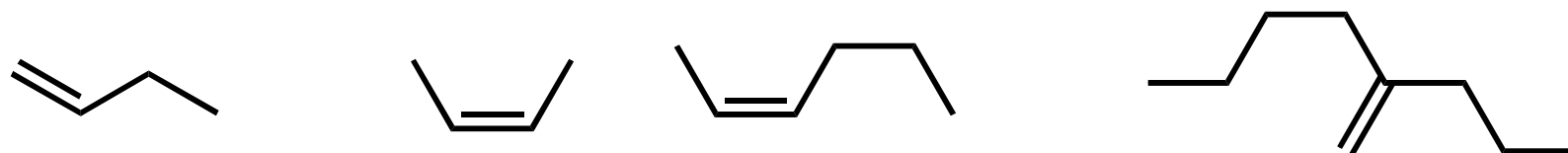


Trans-2-butene  
Bp~1C



# Systematic Nomenclature of Alkenes

1.

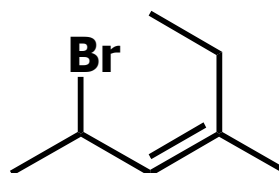
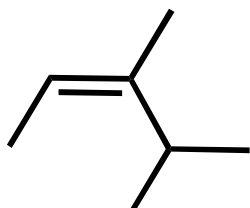


2. Cite the substituents in alphabetical order

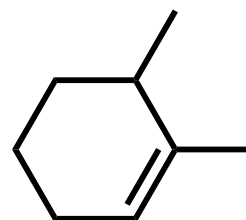
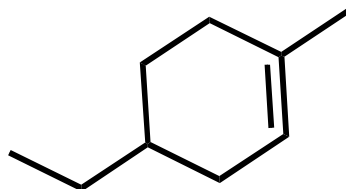
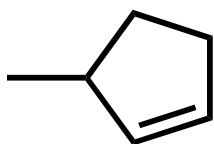




3.

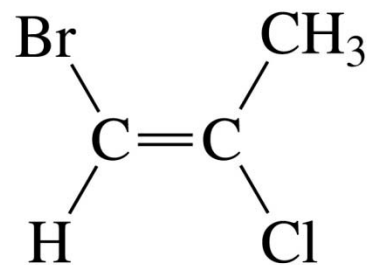
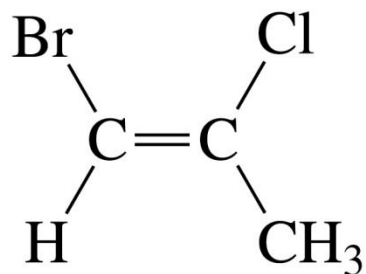


4.

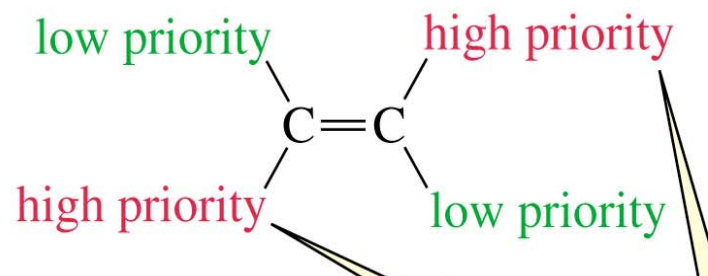
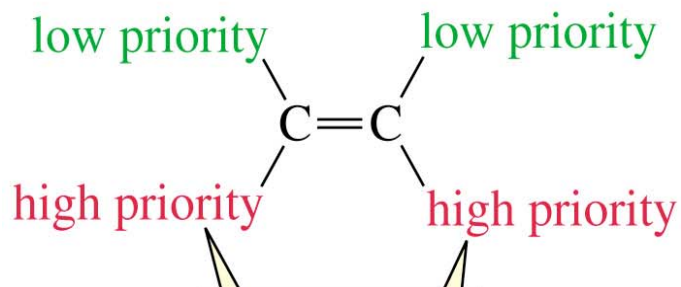




## E and Z isomers



Consider 1-Bromo-2-chloro-propene



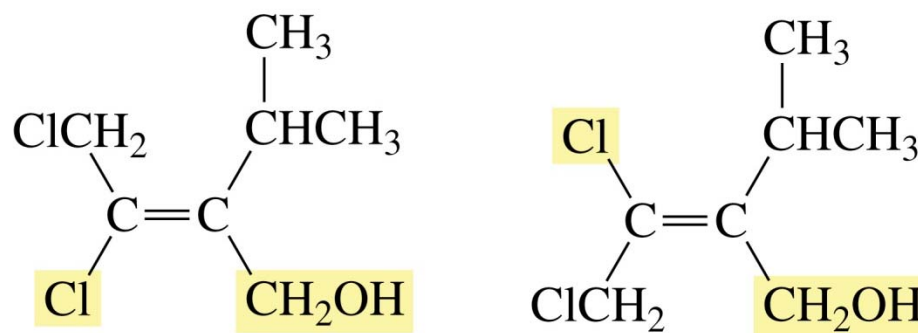


# Naming by the *E,Z* System

Rule 1:

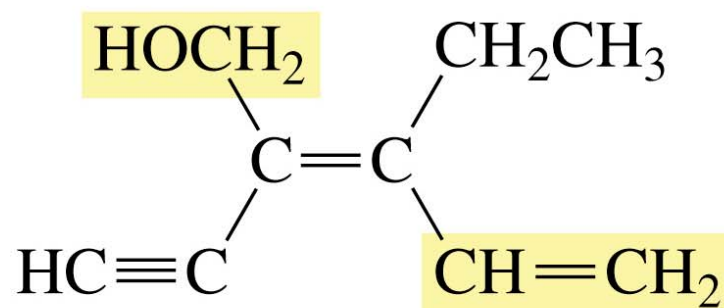
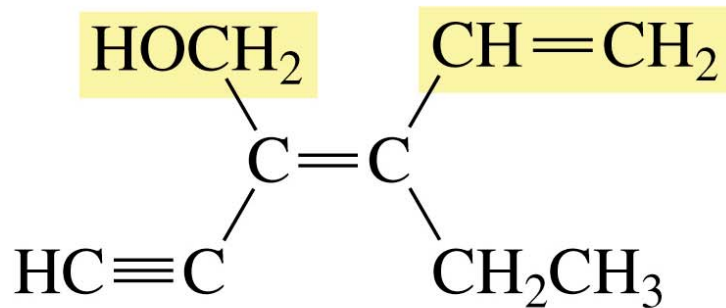
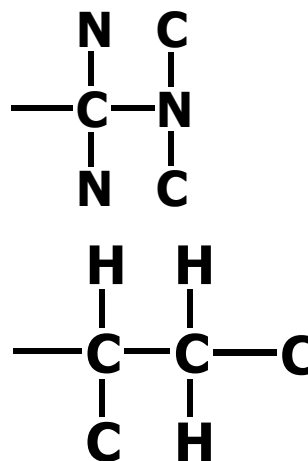
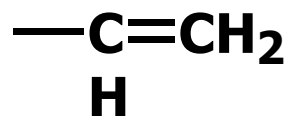


Rule 2:





## Rule 3:





# Chapter 7:

## Part 4: E2 Reactions to make Alkenes

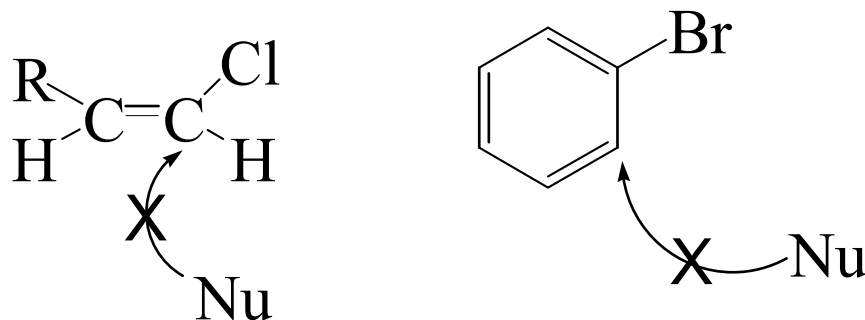
1. SN1 vs. SN2
2. The E2 Mechanism
3. Regiochemistry of the E2 Mechanism
4. The Stereochemistry of the E2 Mechanism



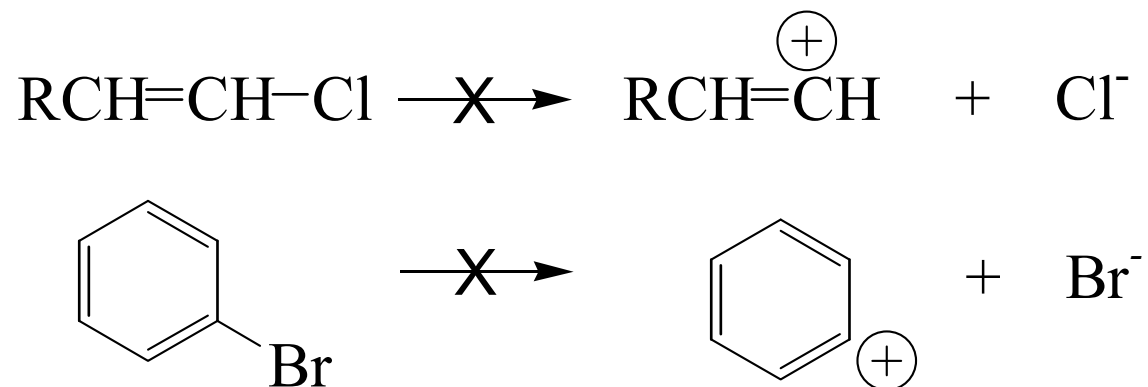
When an alkyl halide can undergo either  $S_N1$  or  $S_N2$ ,



Vinyl and aryl halides do not undergo S<sub>N</sub>2 because?

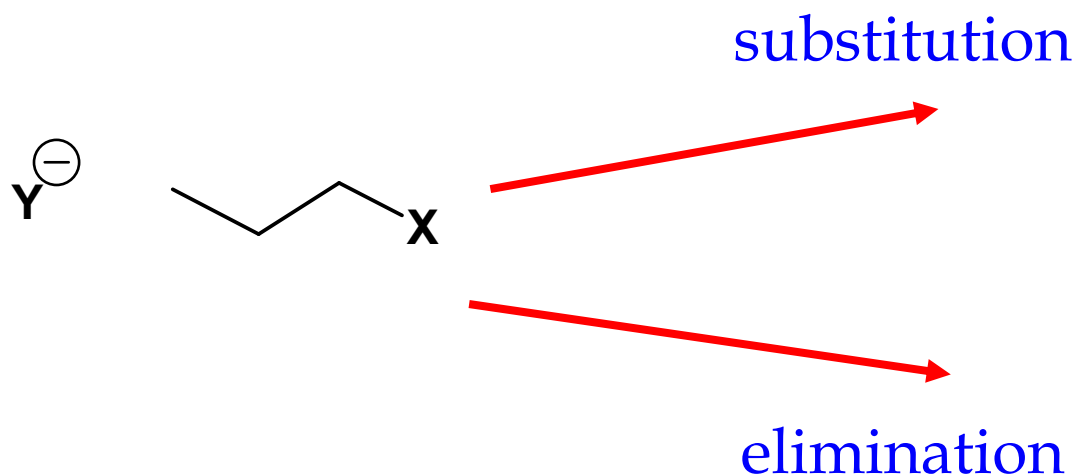


Vinyl and aryl halides do not undergo S<sub>N</sub>1 because?



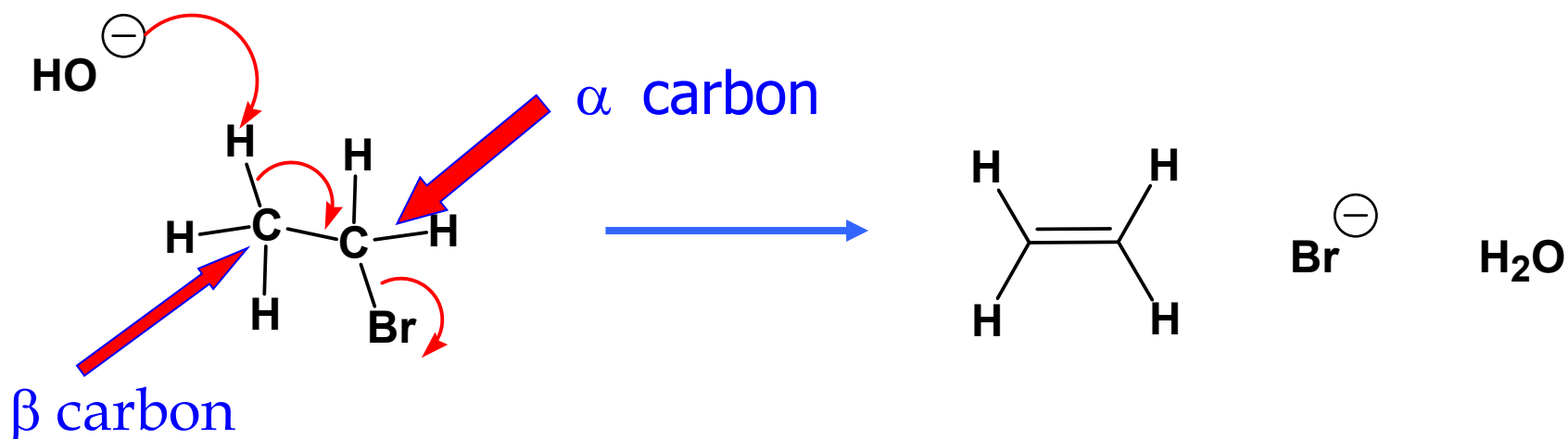
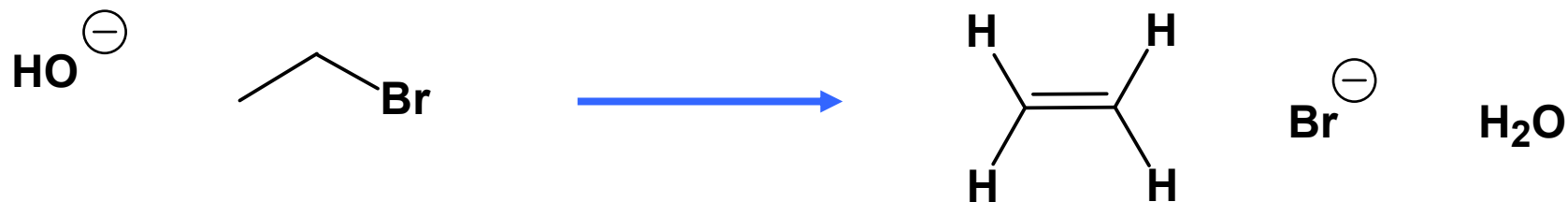


In addition to substitution, an alkyl halide can undergo an elimination reaction



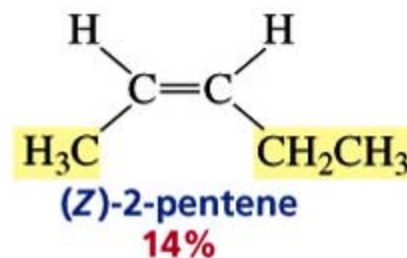
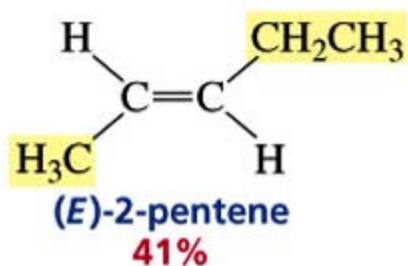
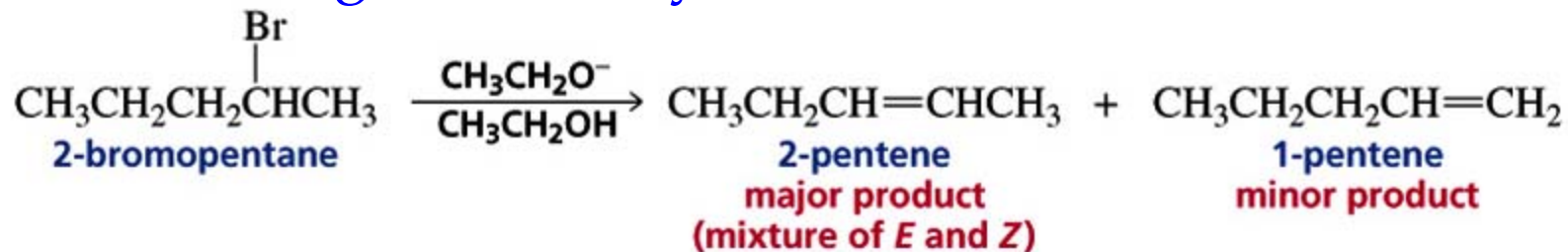


# The E2 Reaction

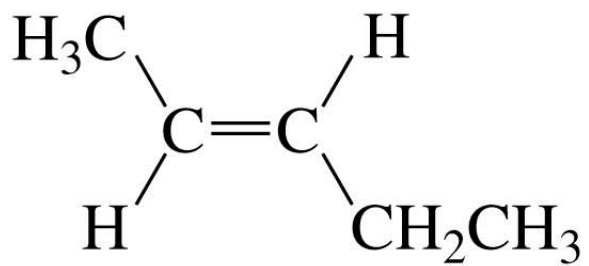
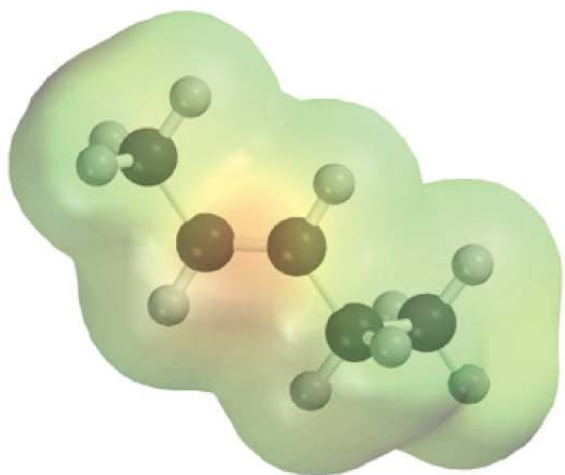




Consider the regioselectivity of the E2 reaction

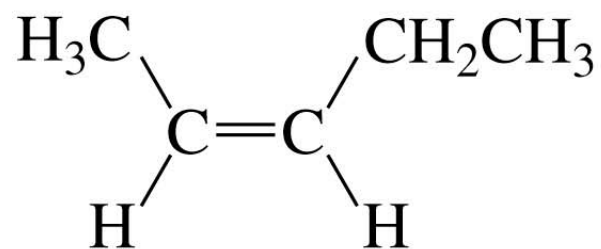
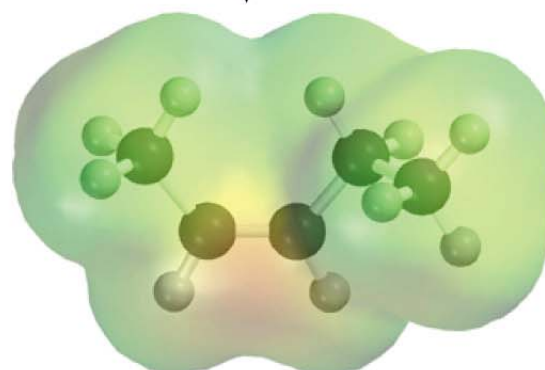






**(E)-2-pentene**

interacting electron  
clouds cause steric strain

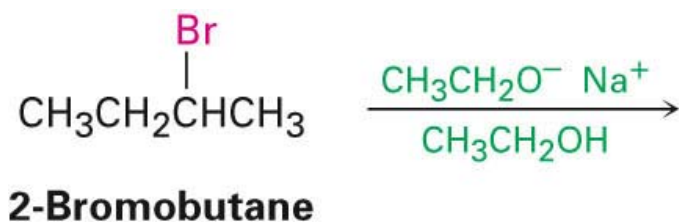


**(Z)-2-pentene**



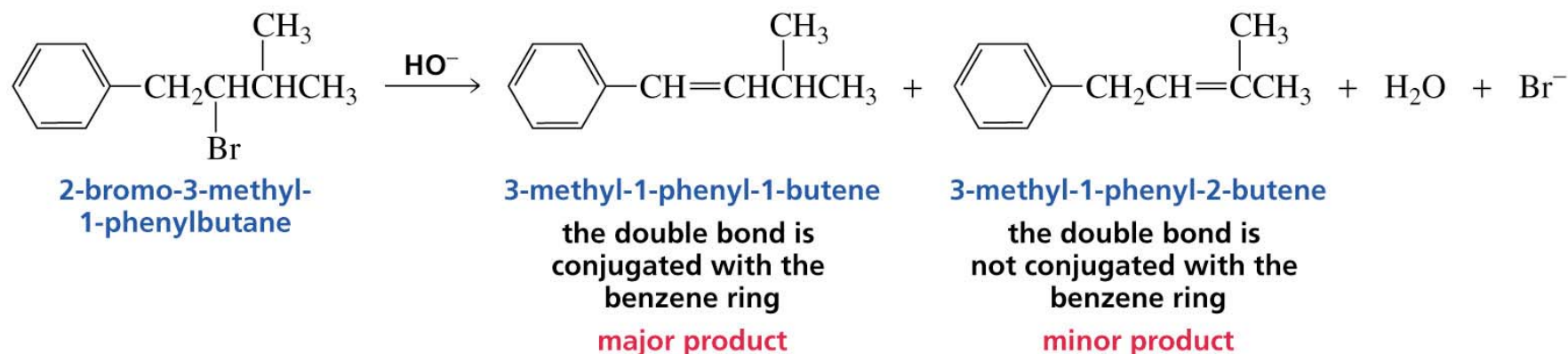
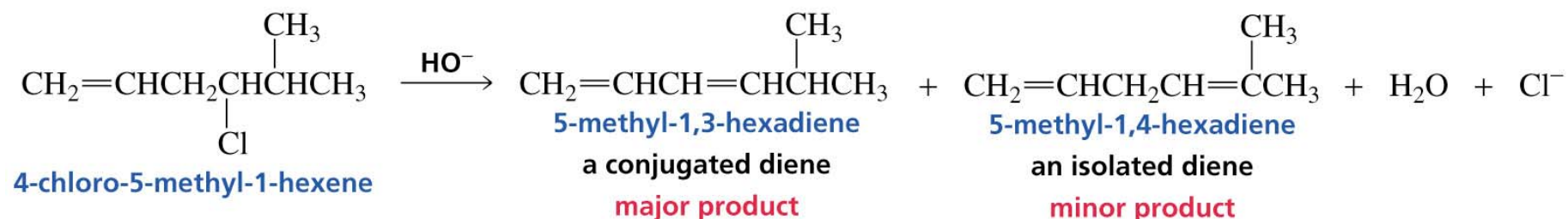
# Zaitsev's Rule for Elimination Reactions

- ◆ In the elimination of HX from an alkyl halide, the more highly substituted alkene product predominates



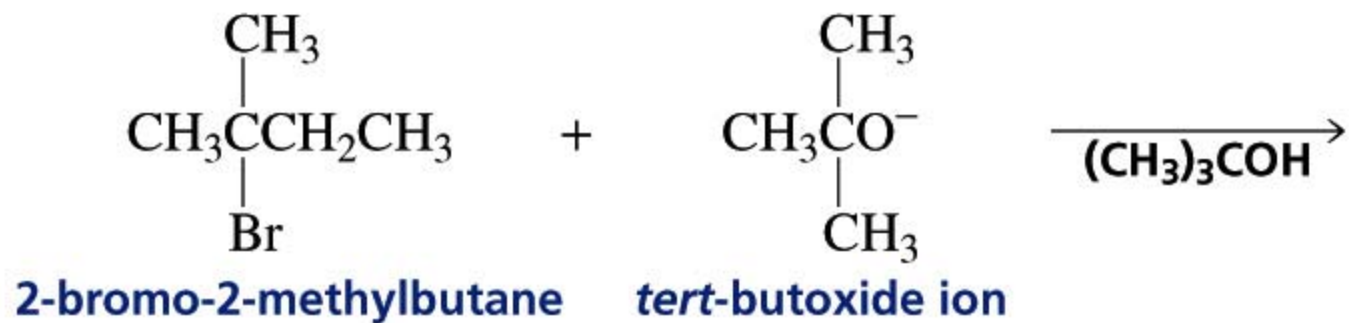


Conjugated alkene products are preferred over the more substituted alkene product





Steric hindrance also affects the product distribution





# Stereochemistry of the E2 Reaction

The best overlap of the interacting orbitals is achieved through back side attack

Anti elimination avoids repulsion of the electron-rich base

The anti elimination is favored over the syn elimination



## *Characteristics of the E2 mechanism*



# For Next Time....

Suggested Homework Problems Chapter 7

#1,14,21,26, 31, 36,38,41,44,50,52,53,59,64,65