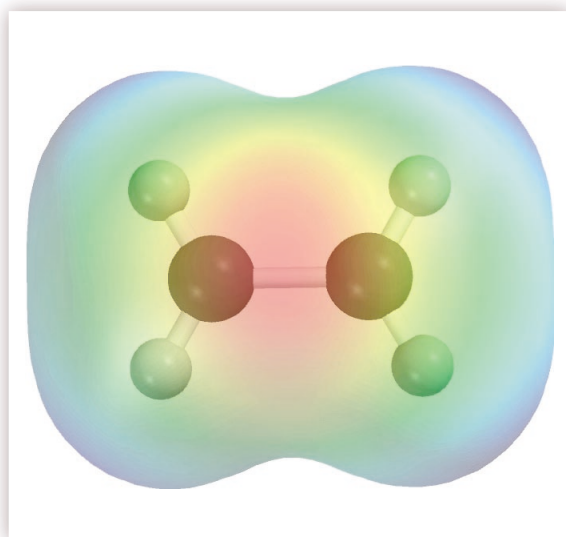


CHAPTER OUTLINE

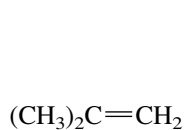
- 4.1 Alkene Nomenclature
 - Ethylene
- 4.2 Structure and Bonding in Alkenes
- 4.3 Isomerism in Alkenes
- 4.4 Naming Stereoisomeric Alkenes by the *E-Z* Notational System
- 4.5 Relative Stabilities of Alkenes
- 4.6 Preparation of Alkenes: Elimination Reactions
- 4.7 Dehydration of Alcohols
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- 4.14 Preparation of Alkynes by Elimination Reactions
 - Natural and "Designed" Enediyne Antibiotics
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- 4.15 Summary
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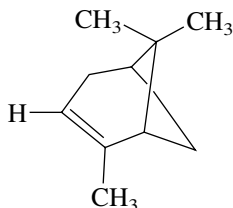
CHAPTER 4

ALKENES AND ALKYNES I: STRUCTURE AND PREPARATION

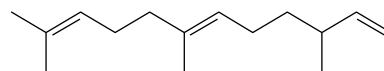
Alkenes are hydrocarbons that contain a carbon–carbon double bond, which is both an important structural unit and an important functional group in organic chemistry. The shape of an organic molecule is influenced by the presence of this bond, and the double bond is the site of most of the chemical reactions that alkenes undergo. Some representative alkenes include isobutylene (an industrial chemical), α -pinene (a fragrant liquid obtained from pine trees), and farnesene (a naturally occurring alkene with three double bonds).



Isobutylene
(used in the production
of synthetic rubber)



α -Pinene
(a major constituent
of turpentine)



Farnesene
(present in the waxy coating
found on apple skins)

Hydrocarbons characterized by the presence of a carbon–carbon triple bond are called **alkynes**. Examples of natural products that contain carbon–carbon triple bonds include tariric acid, from the seed of a Guatemalan plant, and cicutoxin, a poisonous substance isolated from water hemlock.