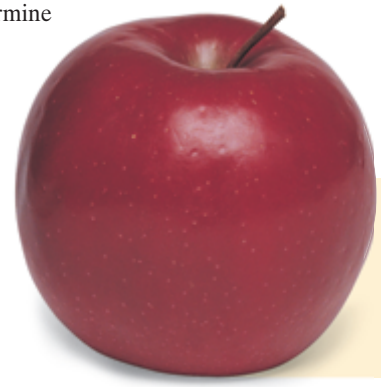
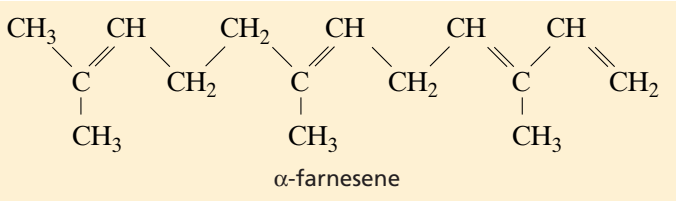
FIGURE 8 α-farnesene is a solid alkene found in the natural wax covering of apples. Can you determine the IUPAC name for this large alkene?





α-farnesene

Properties and Uses of Alkenes

Alkenes are nonpolar and show trends in properties similar to those of alkanes in boiling points and physical states. For example, α-farnesene has 15 carbon atoms and 4 double bonds, as shown in **Figure 8.** This large alkene is a solid at room temperature and atmospheric pressure. It is found in the natural wax covering of apples. Ethene, the smallest alkene, is a gas. Ethene is commonly called *ethylene.*

Ethene is the hydrocarbon commercially produced in the greatest quantity in the United States. It is used in the synthesis of many plastics and commercially important alcohols. Ethene is also an important plant hormone. Induction of flowering and fruit ripening, as shown in **Figure 9,** are effects of ethene hormone action that can be manipulated by commercial growers.

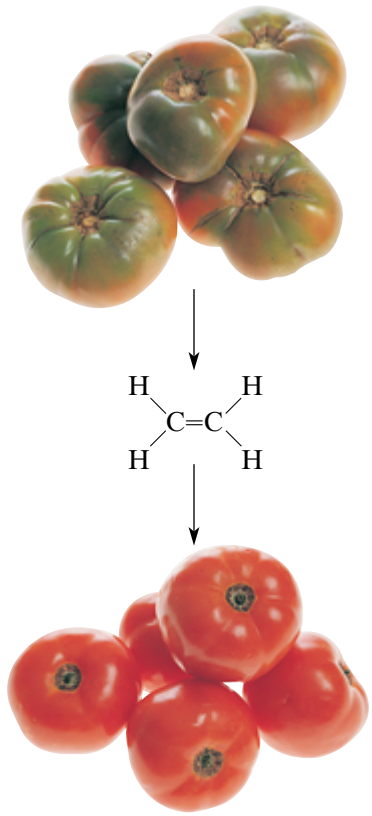


FIGURE 9 Ethene is a plant hormone that triggers fruit ripening. At ordinary conditions, ethene is a gas.

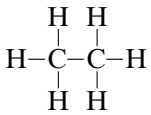
Alkynes

Hydrocarbons with triple covalent bonds are **alkynes.** Like the double bond of alkenes, the triple bond of alkynes requires that the simplest alkyne has two carbon atoms.

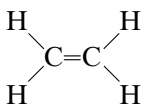
H−C≡C−H

ethyne

The general formula for the alkynes is C_nH_{2n-2}. Alkynes have four fewer hydrogen atoms than the corresponding alkanes and two fewer hydrogen atoms than the corresponding alkenes. The simplest alkyne is ethyne, more commonly known as *acetylene.*



C_2H_6



C_2H_4

H−C≡C−H

C_2H_2