Systematic Naming of Alkynes

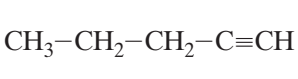
Alkyne nomenclature is almost the same as alkene nomenclature. The only difference is that the *-ene* suffix of the corresponding alkene is replaced with *-yne*. A complete list of rules follows.

Alkyne Nomenclature

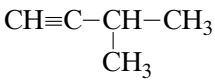
Use the rules for alkane nomenclature on page 721, with the following exceptions.

1. **Name the parent hydrocarbon.** Locate the longest continuous chain that *contains the triple bond(s)*. If there is only one triple bond, add the suffix *-yne.* If there is more than one triple bond, modify the suffix. For example, 2 = *-adiyne,* 3 = *-atriyne,* and so on.
2. **Add the names of the alkyl groups.**
3. **Number the carbon atoms in the parent hydrocarbon.** Number the carbon atoms in the chain so that the first carbon atom in the triple bond nearest the end of the chain has the lowest number.
4. **Insert position numbers.** Place the position numbers of the triple bond immediately before the name of the parent hydrocarbon alkyne. Place alkyl group position numbers immediately before the name of the corresponding alkyl group.
5. **Punctuate the name.**

Two examples of correctly named alkynes are given below.



1-pentyne



3-methyl-1-butyne

extension

Chemistry in Action

Go to **go.hrw.com** for a full-length article on synthetic diamonds.

Keyword: HC6ORGX

Properties and Uses of Alkynes

Alkynes are nonpolar and exhibit the same trends in boiling points and physical state as other hydrocarbons. The smallest alkyne, ethyne, is a gas. The combustion of ethyne when it is mixed with pure oxygen produces the intense heat of welding torches, as shown in **Figure 10.** The common name of ethyne is *acetylene,* and these welding torches are commonly called oxyacetylene torches.

FIGURE 10 Ethyne is the fuel used in oxyacetylene torches. Oxyacetylene torches can reach temperatures of over 3000°C.