

- Describe the bonding between atoms in an alkene.
- What types of bonds are present in an alkyne?
- What is the difference between saturated and unsaturated hydrocarbons?
- Draw and name all the alkenes with the molecular formula C_4H_8 .

For each of the following IUPAC names, draw a structural diagram.

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| 5. ethene (ethylene) | 6. Propyne |
| 7. methylpropene | 8. methyl-1-butyne |
| 9. dimethyl-2-butene | 10. 3-methyl-2-pentene |

For each of the following structural diagrams, write the IUPAC name.

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| 11. $CH_3 - C \equiv C - CH_3$ | 12. $CH_3 - CH_2 - CH_2 - CH = CH_2$ |
| 13. $\begin{array}{c} CH_3 \\ \\ CH_3 - C = CH - CH_3 \end{array}$ | 14. $\begin{array}{c} CH_3 \quad CH_3 \\ \quad \\ CH_3 - CH = C - C - CH_3 \\ \\ CH_3 \end{array}$ |
| 15. $CH_2 = CH - CH_3$ | 16. $\begin{array}{c} CH_3 - C \equiv C - CH - CH_3 \\ \\ CH_3 \end{array}$ |

17. What structure must be present in a molecule for geometric isomers to exist?

18. Draw structural formulas for the following alkenes. If a compound has geometric isomers, draw both *cis* and *trans* forms.

a. 1-pentene

b. 2-hexene

c. 2-methyl-2-hexene

19. There are nine structural isomers of heptane (C₇H₁₆). Find the names of each of them. (You can use the ball and stick models to help visualize them)