

Naming Alkanes

Alkanes

- are hydrocarbons that contain only C-C and C-H bonds
- are formed by a continuous chain of carbon atoms
- are named using the **IUPAC** (International Union of Pure and Applied Chemistry) system
- have names that end in ane

try: An Introduction to General, Organic, and Biological Chemistry, Twelfth Edition

use Greek prefixes to name carbon chains with five or more carbon atoms

© 2015 Pearson Education, Inc.

| Number of Carbon Atoms | Prefix | Name | Molecular | Condensed Structural Formula |
|---------------------------|--------|---------|--------------------------------|--|
| 1 | Meth | Methane | CH | CH ₄ |
| 2 | Eth | Ethane | C ₂ H ₆ | CH ₃ -CH ₃ |
| 3 | Prop | Propane | C ₁ H ₈ | CH ₃ -CH ₂ -CH ₃ |
| 4 | But | Butane | C4H10 | CH ₃ -CH ₂ -CH ₂ -CH ₃ |
| 5 | Pent | Pentane | C ₅ H ₁₂ | CH3-CH2-CH2-CH2-CH3 |
| 6 | Hex | Hexane | C_6H_{14} | CH3-CH2-CH2-CH2-CH2-CH3 |
| 7 | Hept | Heptane | C ₂ H ₁₆ | CH3-CH2-CH2-CH2-CH2-CH2-CH3 |
| 8 | Oct | Octane | C ₈ H ₁₈ | $CH_3 - CH_2 - CH_2 - CH_2 - CH_2 - CH_2 - CH_2 - CH_3$ |
| 9 | Non | Nonane | C ₉ H ₂₀ | CH3-CH2-CH2-CH2-CH2-CH2-CH2-CH2-CH3 |
| 10 | Dec | Decane | C10H22 | CH3-CH2-CH2-CH2-CH2-CH2-CH2-CH2-CH2-CH2-CH2 |





In a condensed structural formula,

mistry: An Introduction to General, Organic, and Biological Chemistry, Twelfth Edition

Che

- each carbon atom and its attached hydrogen atoms are written as a group
- a subscript indicates the number of hydrogen atoms bonded to each carbon atom

The condensed structural formula of butane has four carbon atoms.

CH₃—CH₂—CH₂—CH₃ butane

© 2015 Pearson Education. Inc

Core Chemistry Skill Naming and Drawing Alkanes

























Solution

Write the condensed structural formula for A. ethane CH_3 — CH_3

tion to General. Organic. and Biological Che

B. heptane CH_3 — CH_2 — CH_2 — CH_2 — CH_2 — CH_2 — CH_2 — CH_3

© 2015 Pearson Education. Inc















| Solution | |
|--|---|
| Name the following alkanes: | |
| A. CH ₃ —CH ₂ —CH ₂ —CH ₃ B. | butane cyclopropane |
| C. CH ₃ —CH ₂ —CH ₂ —CH ₂ —CH ₂ —CH ₂ —CH ₂ —CH | ¹ 2CH ₃ octane |
| D. | cyclohexane |
| Chemistry: An Introduction to General, Organic, and Biological Chemistry, Twelfth Edition | © 2015 Pearson Education, Inc. |

