



CHEMISTRY

ALKANES

Naming Simple Hydrocarbons

Hydrocarbons are large molecular compounds comprised mainly of hydrogen and carbon atoms. The carbon atoms create the “backbone” of the molecule and the hydrogen atoms fill in the spaces required to fill all of carbon's bonding sites.

A hydrocarbon is named based on the number of carbon atoms it has in its backbone. There are many hydrocarbons of various complexities. The simplest of these structures are straight chains of carbon and hydrogen called:

Alkanes (alk**ANE**s).

Name	No. of Carbon Atoms	Molecular Formula	Diagram
<i>Methane</i>	1		
<i>Ethane</i>	2		
<i>Propane</i>	3		

**CHEMISTRY****ALKANES**Naming Simple Hydrocarbons (Cont)

Name	No. of Carbon Atoms	Molecular Formula	Diagram
<i>Butane</i>	4		
<i>Pentane</i>	5		
<i>Hexane</i>	6		
<i>Heptane</i>	7		
<i>Octane</i>	8		
<i>Nonane</i>	9		
<i>Decane</i>	10		

**CHEMISTRY****ALKANES**Branched-Chain Alkanes

Some straight-chain alkanes have branches of smaller alkanes coming off of their main backbone. The smaller chains have a separate prefix to indicate that they are a side-chain:

No. of Carbon Atoms in Side-Chain	Name of Branch
1	Methyl
2	Ethyl
3	Propyl
4	Butyl

A number is used to indicate where on the backbone a side-chain is located.

Ex: 2-Methylpentane

This means there is a methyl branch off the 2nd carbon in the pentane chain.

Ex: 3,5-diethyloctane

Ex: 3-ethyl-2,2-dimethylhexane

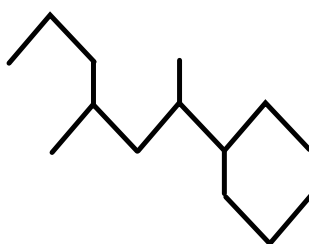
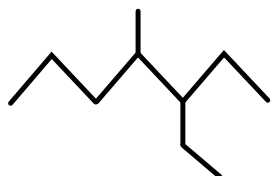


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Naming Alkanes

Naming is also straightforward. First, locate the longest chain in the compound; this is your backbone. Then, name the side-chains using the smallest number possible to locate their position. Di's and Tri's are used to indicate multiples of the same side group.





CHEMISTRY

WORKSHEET

Name _____

Period _____

Naming Alkanes – Worksheet #1

Name the following branched alkanes:

1.	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}-\text{CH}_3 \\ \\ \text{CH}_3 \end{array}$	
2.	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}-\text{CH}_3 \\ \\ \text{CH}_2-\text{CH}_3 \end{array}$	
3.	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}_2-\text{CH}_3 \\ \\ \text{CH}_2-\text{CH}_3 \end{array}$	
4.	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}-\text{CH}-\text{CH}_2-\text{CH}_3 \\ \qquad \\ \text{CH}_3 \qquad \text{CH}_2-\text{CH}_3 \end{array}$	
5.	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}-\text{CH}_2-\text{CH}_3 \\ \qquad \qquad \\ \text{CH}_3 \qquad \qquad \text{CH}_2-\text{CH}_2-\text{CH}_3 \end{array}$	
6.	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2 \\ \\ \text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{C}-\text{CH}_2-\text{CH}_3 \\ \\ \text{CH}_3 \end{array}$	
7.	$\begin{array}{c} \text{H}_2\text{C}-\text{CH}-\text{CH}_2-\text{CH}-\text{CH}_3 \\ \qquad \qquad \\ \text{CH}_3 \qquad \qquad \text{CH}_2-\text{CH}_2-\text{CH}_3 \end{array}$	

(over)

**CHEMISTRY****WORKSHEET**

Draw structural formulas for the following molecules. Remember the following:

- Carbons on the end of a chain are attached to three hydrogens
- Carbons in the middle of a chain are attached to two hydrogens
- Carbons that have one branch attached are also attached to one hydrogen
- Carbons that have two branches attached are not attached to any hydrogens.

8. 4-ethyl-octane

9. 2-methyl-nonane

10. 2-methyl-2-ethyl-butane

11. 3-ethyl-pentane

12. 2-methyl-3-ethyl-heptane