Naming Hydrocarbons

There are at least 10 million carbon-based compounds in existence, with new ones being made each year. With such a vast number of compounds it is critical that there be a consistent naming system. The International Union of Pure and Applied Chemistry (IUPAC) has the task of keeping the rules for naming compounds up-to-date. Scientists throughout the world follow these rules.

Try to derive some of the IUPAC rules for naming hydrocarbons by examining the names of some of the molecules that you made with the molecular model sets.

<table>
<thead>
<tr>
<th>Structural formula</th>
<th>Chemical formula</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>CH₄</td>
<td>methane</td>
</tr>
<tr>
<td>H</td>
<td>C₂H₆</td>
<td>ethane</td>
</tr>
<tr>
<td>H</td>
<td>C₂H₄</td>
<td>ethene</td>
</tr>
<tr>
<td>H</td>
<td>C₂H₂</td>
<td>ethyne</td>
</tr>
<tr>
<td>H</td>
<td>C₃H₈</td>
<td>propane</td>
</tr>
</tbody>
</table>
Name ___________________________________________________ Date ___________

\[
\begin{align*}
\text{C}_3\text{H}_6 & \quad \text{propene} \\
\text{C}_3\text{H}_4 & \quad \text{propyne} \\
\text{C}_4\text{H}_{10} & \quad \text{butane} \\
\text{C}_4\text{H}_8 & \quad \text{but-1-ene} \\
\text{C}_4\text{H}_8 & \quad \text{but-2-ene} \\
\text{C}_4\text{H}_8 & \quad \text{but-1-yne} \\
\text{C}_4\text{H}_6 & \quad \text{but-2-yne} \\
\text{C}_4\text{H}_6 & \quad \text{2-methylpropane}
\end{align*}
\]

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2-methylprop-1-ene

(also known as
2-methyl-1-propene)

pentane

pent-1-ene

(also known as
1-pentene)

pent-2-ene

(also known as
2-pentene)

pent-1-yne

(also known as
1-pentyne)

pent-2-yne

(also known as
2-pentyne)
2-methylbutane

C₅H₁₂

2,2-dimethylpropane

C₅H₁₂

2-methylbut-2-ene

C₅H₁₀

(also known as
2-methyl-2-butene)

3-methylbut-1-yne

C₅H₈

(also known as
3-methyl-1-butyne)