

## Alkane Properties

Open-chain alkanes (without rings) all have the general formula  $C_nH_{2n+2}$ , where  $n$  equals the number of carbon atoms. The following table shows the structures and names for the first 10 unbranched, open-chain alkanes. Look at the trends in the boiling and melting points and the density of the alkanes as their mass increases.

IUPAC name	Molecular Formula	Structural Formula	Boiling Point (°C)	Melting Point (°C)	Density (g/ml, 20° C)
<b>Methane</b>	CH <sub>4</sub>	CH <sub>4</sub>	-161.5	-182.5	
<b>Ethane</b>	C <sub>2</sub> H <sub>6</sub>	CH <sub>3</sub> CH <sub>3</sub>	-88.6	-183.3	
<b>Propane</b>	C <sub>3</sub> H <sub>8</sub>	CH <sub>3</sub> CH <sub>2</sub> CH <sub>3</sub>	-42.1	-189.7	
<b>Butane</b>	C <sub>4</sub> H <sub>10</sub>	CH <sub>3</sub> (CH <sub>2</sub> ) <sub>2</sub> CH <sub>3</sub>	-0.5	-138.4	
<b>Pentane</b>	C <sub>5</sub> H <sub>12</sub>	CH <sub>3</sub> (CH <sub>2</sub> ) <sub>3</sub> CH <sub>3</sub>	36.1	-129.7	0.626
<b>Hexane</b>	C <sub>6</sub> H <sub>14</sub>	CH <sub>3</sub> (CH <sub>2</sub> ) <sub>4</sub> CH <sub>3</sub>	68.7	-95.3	0.659
<b>Heptane</b>	C <sub>7</sub> H <sub>16</sub>	CH <sub>3</sub> (CH <sub>2</sub> ) <sub>5</sub> CH <sub>3</sub>	98.4	-90.6	0.684
<b>Octane</b>	C <sub>8</sub> H <sub>18</sub>	CH <sub>3</sub> (CH <sub>2</sub> ) <sub>6</sub> CH <sub>3</sub>	125.7	-56.8	0.703
<b>Nonane</b>	C <sub>9</sub> H <sub>20</sub>	CH <sub>3</sub> (CH <sub>2</sub> ) <sub>7</sub> CH <sub>3</sub>	150.8	-53.5	0.718
<b>Decane</b>	C <sub>10</sub> H <sub>22</sub>	CH <sub>3</sub> (CH <sub>2</sub> ) <sub>8</sub> CH <sub>3</sub>	174.1	-29.7	0.730