

**ALKANE NAMES (Memorize)** (Sections 3.2)

# C's	Name	Formula	Bp (°C)	Structure
1	Methane	CH <sub>4</sub>	-162	H-(CH <sub>2</sub> )-H
2	Ethane	C <sub>2</sub> H <sub>6</sub>	-89	H-(CH <sub>2</sub> ) <sub>2</sub> -H
3	Propane	C <sub>3</sub> H <sub>8</sub>	-42	H-(CH <sub>2</sub> ) <sub>3</sub> -H
4	Butane	C <sub>4</sub> H <sub>10</sub>	0	H-(CH <sub>2</sub> ) <sub>4</sub> -H
5	Pentane	C <sub>5</sub> H <sub>12</sub>	36	H-(CH <sub>2</sub> ) <sub>5</sub> -H
6	Hexane	C <sub>6</sub> H <sub>14</sub>	69	H-(CH <sub>2</sub> ) <sub>6</sub> -H
7	Heptane	C <sub>7</sub> H <sub>16</sub>	98	H-(CH <sub>2</sub> ) <sub>7</sub> -H
8	Octane	C <sub>8</sub> H <sub>18</sub>	126	H-(CH <sub>2</sub> ) <sub>8</sub> -H
9	Nonane	C <sub>9</sub> H <sub>20</sub>	151	H-(CH <sub>2</sub> ) <sub>9</sub> -H
10	Decane	C <sub>10</sub> H <sub>22</sub>	174	H-(CH <sub>2</sub> ) <sub>10</sub> -H

**Industrial Alkanes** (Sections 3.5)

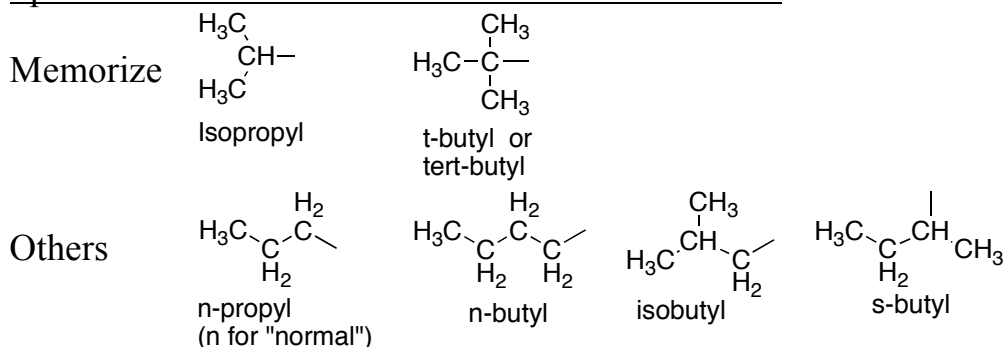
Name	# C's	Boiling Range	Use
Natural Gas	C <sub>1</sub> -C <sub>3</sub> (70% methane)	Gas	Fuel
"Petroleum Gas"	C <sub>2</sub> -C <sub>4</sub>	<30°	Heating, Gas
Propane	C <sub>3</sub>	-42°	Propane tanks, camping, etc.
Gasoline	C <sub>4</sub> -C <sub>9</sub>	30-180°	Car fuel
Kerosene	C <sub>8</sub> -C <sub>16</sub>	160-230°	Jet fuel
Diesel	C <sub>10</sub> -C <sub>18</sub>	200-320°	Truck fuel
Heavy Oils	C <sub>16</sub> -C <sub>30</sub>	300-450°	
Motor Oils		High temp	
Paraffin		Vacuum	
Asphalt		Never Distills	
Coke		Never Distills	

**Nomenclature of Alkanes** (Sections 3.3)**Systematic IUPAC Rules for Branched and Substituted Alkanes (Section 3.3B)**

1. Longest continuous C-chain → "core name"
2. Number core chain from an end nearest a substituent
3. Name substituents as "alkyl" groups:
4. Specify the location of substituents using numbers (hyphenate the #'s)
  - If >2 substituents, list alphabetically
  - Use di-, tri-, tetra- if the same substituent is repeated. (But ignore these in alphabetizing).

**Punctuation Notes:**

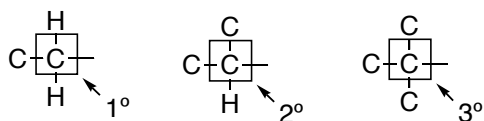
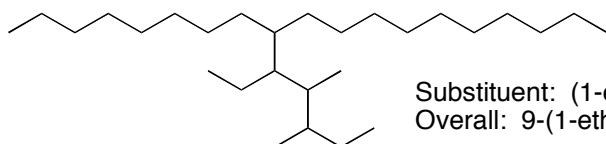
- Hyphenate numbers
- Do not put a space between substituents and the core name

**Special Names for Some 3 or 4-carbon Substituents****Another Classification System**

Primary (1°): with one attached carbon

Secondary (2°): with two attached carbons

Tertiary (3°): with three attached carbons

**Very Complex Substituents (Not responsible)**

Substituent: (1-ethyl-2,3-dimethylpentyl)  
Overall: 9-(1-ethyl-2,3-dimethylpentyl)nonadecane

**Nomenclature Example Problems** (Sections 3.5)