

## Hydrocarbon Chains

A hydrocarbon is one of the most simple and primitive of organic compounds. All living organisms produce hydrocarbons, one such example is plants, they synthesize waxes containing hydrocarbons in order to prevent leaf surface decay. This is what makes their leaves shiny. Almost all useable supplies of hydrocarbons are obtained from fossil fuels - coal, petroleum, and natural gas.

Hydrocarbons contains only carbon and hydrogen atoms. These atoms link together to form straight, branched chains, or ring structures commonly called PAHs (poly aromatic hydrocarbons).

Examples of common hydrocarbons are: gasoline, diesel fuels, lighter fluid, propane, home heating oil, marine and motor oil, fuels, cleaning solvents, hydraulic fluids, crude oil and lubricating oils.

## Hydrocarbon Chains

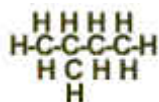
Product	Carbon Chain	Molecular Formula	Boiling Point	Melting Point	State	Uses
Methane	C1	CH <sub>4</sub>	-161	-182.5	Gas	Fuel, carbon black, gasoline
Ethane	C2	C <sub>2</sub> H <sub>6</sub>	-88	-183.3	Gas	Chemistry
Propane	C3	C <sub>3</sub> H <sub>8</sub>	-46	-189.7	Gas	Cigarette lighter fuel and barbecues.
Butane	C4	C <sub>4</sub> H <sub>10</sub>	-1	-138.40	Gas	Cigarette lighters fuel and barbecues.
Pentane	C5	C <sub>5</sub> H <sub>12</sub>	36.1	-129.7	Liquid	Solvents, dry cleaning, refrigerant
Hexane	C6	C <sub>6</sub> H <sub>14</sub>	68.7	-95.3	Liquid	Motor fuel
Heptane	C7	C <sub>7</sub> H <sub>16</sub>	98.4	-90.6	Liquid	Solvents
Octane	C8	C <sub>8</sub> H <sub>18</sub>	125.7	-56.8	Liquid	Solvents
Nonane	C9	C <sub>9</sub> H <sub>20</sub>	150.8	-53.5	Liquid	Solvents
Decane	C10	C <sub>10</sub> H <sub>22</sub>	174.1	-29.7	Liquid	Solvents
Kerosene	C12 - C16		200 - 315		Liquid	Diesel, heating oil, lighting/oil stove fuels.
Fuel Oil	C15 - C18		Up to 375		Liquid	Furnace oils, diesels
Lubricating Oils	C16 - C20		350 up		Liquid	Lubrication
Grease, Vaseline	C20 & up				Semisolid	Lubrication, sizing paper
Paraffin - Wax	C26 & up				Solid	Candles, match sticks, household canning
Pitch and Tar	C26 & up				Residue	Roofing, paving, rubber
Petroleum Coke	C26 & up				Residue	Fuel, carbon electrode

The carbon atoms of different hydrocarbons are organized into two general groups:

**Aliphatic:** a straight or branched chain.

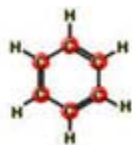


Straight chain (pentane)  $\text{C}_5\text{H}_{12}$



Branched chain (isopentane)  $\text{C}_5\text{H}_{10}$

**Aromatic:** contains 1 or more benzene rings. Their name comes from the fact that many have strong, pungent aromas. A PAH is a group of benzene rings which have branched chains of carbon.



Aromatic (benzene)

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