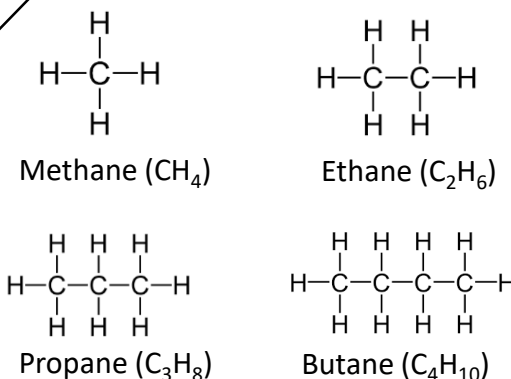




Crude oil	<i>A finite resource</i>	Consisting mainly of plankton that was buried in the mud, crude oil is the remains of ancient biomass.
Hydrocarbons	<i>These make up the majority of the compounds in crude oil</i>	Most of these hydrocarbons are called alkanes.
General formula for alkanes	C_nH_{2n+2}	For example: C_2H_6 C_6H_{14}

Crude oil, hydrocarbons and alkanes

Display formula for first four alkanes



Carbon compounds as fuels and feedstock

AQA GCSE Organic chemistry 1

Carbon compounds as fuels and feedstock

Cracking and alkenes

Fractional distillation and petrochemicals

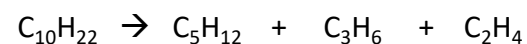
Hydrocarbon chains	In oil	Hydrocarbon chains in crude oil come in lots of different lengths.
	Boiling points	The boiling point of the chain depends on its length. During fractional distillation, they boil and separate at different temperatures due to this.

Properties of hydrocarbons

Combustion

During the complete combustion of hydrocarbons, the carbon and hydrogen in the fuels are oxidised, releasing carbon dioxide, water and energy.

Decane $\rightarrow$ pentane + propene + ethane



Complete combustion of methane:
Methane + oxygen $\rightarrow$ carbon dioxide + water + energy
 $\text{CH}_4(\text{g}) + 2\text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l})$

Alkanes to alkenes	<i>Long chain alkanes are cracked into short chain alkenes.</i>
Alkenes	<i>Alkenes are hydrocarbons with a double bond (some are formed during the cracking process).</i>
Properties of alkenes	<i>Alkenes are more reactive than alkanes and react with bromine water. Bromine water changes from orange to colourless in the presence of alkenes.</i>

Cracking	<i>The breaking down of long chain hydrocarbons into smaller chains</i>	The smaller chains are more useful. Cracking can be done by various methods including catalytic cracking and steam cracking.
Catalytic cracking	<i>The heavy fraction is heated until vaporised</i>	After vaporisation, the vapour is passed over a hot catalyst forming smaller, more useful hydrocarbons.
Steam cracking	<i>The heavy fraction is heated until vaporised</i>	After vaporisation, the vapour is mixed with steam and heated to a very high temperature forming smaller, more useful hydrocarbons.

Alkenes and uses as polymers

Used to produce polymers. They are also used as the starting materials of many other chemicals, such as alcohol, plastics and detergents.

Why do we crack long chains?

Without cracking, many of the long hydrocarbons would be wasted as there is not much demand for these as for the shorter chains.

Boiling point (temperature at which liquid boils)

As the hydrocarbon chain length increases, boiling point increases.

Viscosity (how easily it flows)

As the hydrocarbon chain length increases, viscosity increases.

Flammability (how easily it burns)

As the hydrocarbon chain length increases, flammability decreases.

