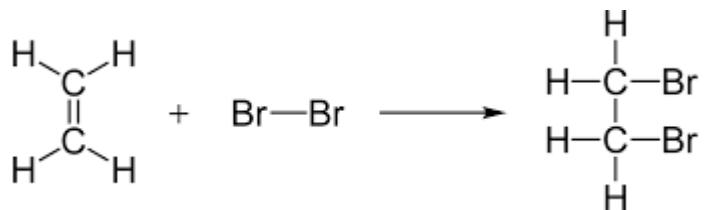
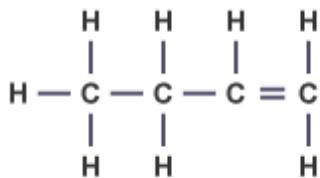
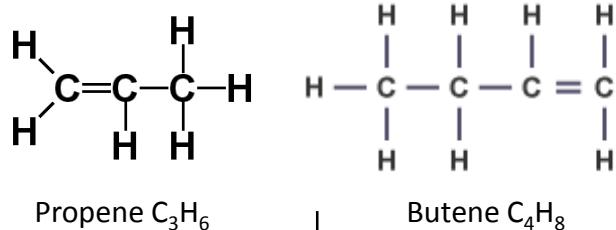
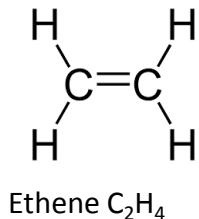


Combustion
During the complete combustion of hydrocarbons, the carbon and hydrogen in the fuels are oxidised, releasing carbon dioxide, water and energy.

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



Testing for 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>
Addition reaction	<i>The double bond within the alkene breaks and a bromine atom bonds to each carbon with a single bond.</i>



Alkenes

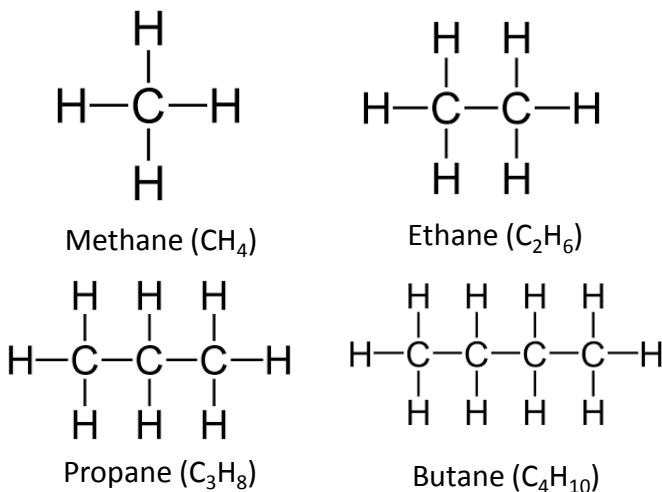
Alkanes to alkenes	<i>Long chain alkanes are cracked into short chain alkenes.</i>
Alkenes	<i>Alkenes are hydrocarbons with a double bond (some are formed during the cracking process).</i>
General formula	C_nH_{2n} <i>For example: C_3H_6</i>

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Hydrocarbons

Alkanes

Hydrocarbons	<i>These make up the majority of the compounds in crude oil</i>	Most of these hydrocarbons are called alkanes.
Alkanes	<i>General formula: $\text{C}_n\text{H}_{2n+2}$</i> <i>For example: C_2H_6</i>	Alkanes are saturated as the compounds have single bonds between the atoms.



Element	Colour flames
Lithium	Red
Sodium	Yellow
Potassium	Lilac
Calcium	Orange-red
Copper	Blue-green

Flame tests

Sodium hydroxide test

Sodium hydroxide	<i>Is added to solutions to identify metal ions.</i>
White precipitates	<i>Aluminium, calcium and magnesium ions form this with sodium hydroxide solution.</i>
Coloured precipitates	<i>Copper (II) = blue-green Iron (II) = green Iron (III) = brown</i>

Carbonates, halides and sulfates

Carbonates	<i>React with dilute acids to form carbon dioxide.</i>
Halide ions	<i>When in a solution, they produce precipitates with silver nitrate solution in the presence of nitric acid.</i>
Sulfate ions	<i>When in a solution they produce a white precipitate with barium chloride solutions in the presence of hydrochloric acid.</i>

Qualitative analysis: tests for ions

Testing for ammonia	<i>Damp red litmus paper</i>	Will turn blue in the presence of ammonia. Can also be identified by its characteristic smell.
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Instrumental methods	<i>Methods that rely on machines</i>	Can be used to identify elements and compounds. These methods are accurate, sensitive and rapid.
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Flame photometry	<i>An instrumental method used to analyse metal ions</i>	Analyses the concentration of ions in a dilute solution using a calibration curve. The user compares the results to known data in order to identify the metal ions and their concentration.
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