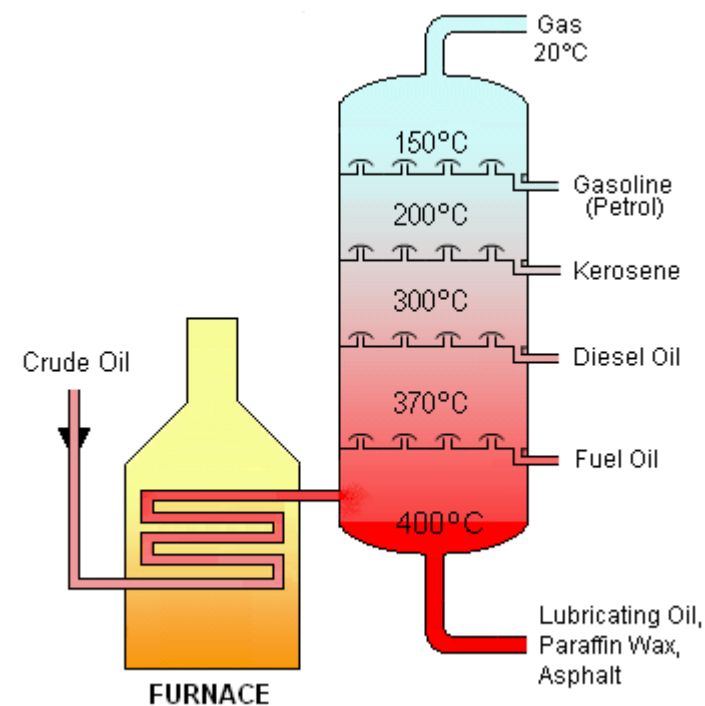
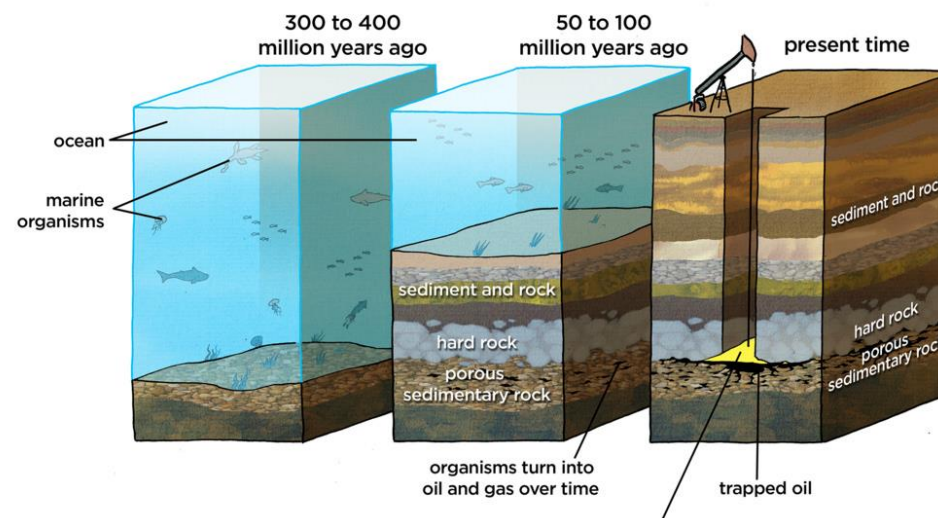


Key Terms

Knowledge Organiser – Organic Chemistry

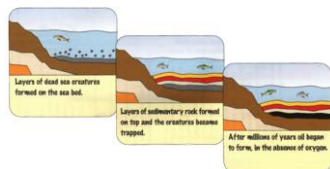
Diagrams

Biomass	A resource made from living or recently living organisms.
Hydrocarbon	A compound containing hydrogen and oxygen only.
Alkanes	A homologous series of saturated hydrocarbons with the general formula C_nH_{2n+2} .
Saturated	A molecule that only contains single covalent bonds. It contains no double covalent bonds.
Displayed Formula	Drawing of a molecule showing all atoms and bonds.
Homologous Series	A family of compounds with the same general formula and similar chemical properties.
Fractional Distillation	A method used to separate miscible liquids with different boiling points.
Fraction	A mixture of molecules with similar boiling points.
Complete Combustion	When a substance burns with a good supply of oxygen.
Flammability	How easily a substance catches fire; the more flammable, the more easily it catches fire.
Viscosity	How easily a liquid flows; the higher the viscosity the less easily it flows.
Alkenes	A homologous series of unsaturated hydrocarbons with the general formula C_nH_{2n} .
Unsaturated	A molecule that contains one or more double covalent bonds.
Polymer	A long chain molecule in which lots of small molecules (monomers) are joined together.



Hydrocarbons

Crude Oil is made from the remains of living **sea creatures** decayed in mud millions of years ago



It is a **FINITE** resource

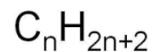
It is made of a mixture of Hydrocarbons.

Hydrocarbons are made of **Hydrogen and Carbon only**.

The main hydrocarbons in Crude Oil are **alkanes**

Alkane	Molecular formula	Structural formula
Methane	CH ₄	<pre> H H-C-H H </pre>
Ethane	C ₂ H ₆	<pre> H H H-C-C-H H H </pre>
Propane	C ₃ H ₈	<pre> H H H H-C-C-C-H H H H </pre>
Butane	C ₄ H ₁₀	<pre> H H H H H-C-C-C-C-H H H H H </pre>

The general formula for an alkane is -

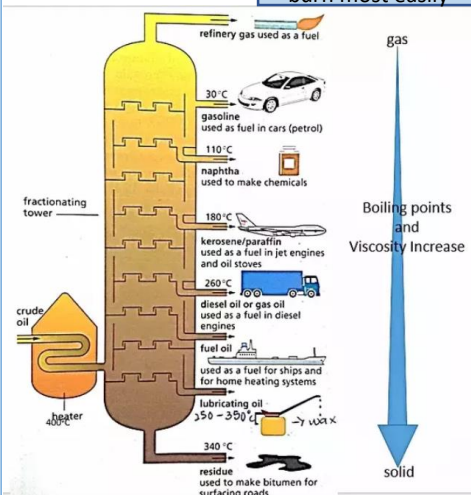


Fractional Distillation

How do we separate the mixture of hydrocarbons to use them?

Works by **evaporation** and then **condensation**.

Smaller molecules burn most easily



1. Heat the crude oil to **evaporate** it.
2. The gases **rise** up the column.
3. The different fractions **condense** at **different temperatures**.

C7 organic chemistry

Combustion

Combustion (burning) is a reaction with **oxygen**

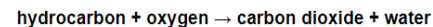
A reaction with oxygen is called '**oxidation**'

When hydrocarbons burn a lot of **energy** is released.

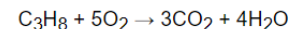
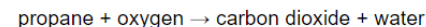
Complete combustion of hydrocarbons the only products are **carbon dioxide and water**

Complete combustion only happens if there is plenty of oxygen

General equation



Complete combustion of propane

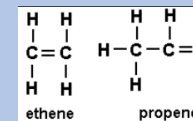


Cracking

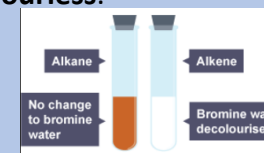
The larger molecules from fractional distillation are less useful. We can break them down into smaller, more useful molecules.

Cracking produces a mixture of **alkanes and alkenes**.

Alkenes have some **double bonds**.

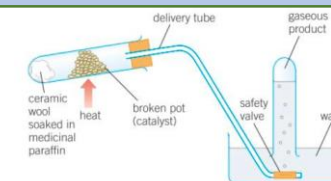


They turn **bromine water colourless**.



They are used to make **polymers**.

The apparatus for cracking



Catalytic cracking – catalyst and 500°C

Steam cracking – steam and 850°C