Hydrocarbons

Made out of only hydrogen and carbon.

Alkanes have the general formula H_nC_{2n+2}.

Alkanes are homologous- they react in a similar way.

Alkanes are saturated- they all have **four covalent bonds**.

The first four alkanes are ***m**ethane, **e**thane, **p**ropene and **b**utane*.

These can be remembered by **M**y **E**lephants **P**ooey **B**um.

As the chains get shorter, the flammability, volatility, and thickness **decreases**.

Short chain hydrocarbons are more useful than longer ones.

Cracking

Cracking is the breaking of long chain hydrocarbons into small ones.

Cracking produces an alkane and an alkene.

Cracking is a thermal decomposition reaction.

Catalytic Cracking- You can pass long chain molecules over a hot powdered aluminium oxide catalyst.

Thermal Cracking- You can crack hydrocarbons by vaporising them, mixing them with steam and heating them to a very high temperature.

What ever goes into a cracking reaction comes out.

Combustion of Hydrocarbons

The complete combustion of any hydrocarbon in oxygen releases a lot of energy.

Hydrocarbon + Oxygen --> Carbon Dioxide + Water (+energy)

Both carbon and hydrogen are oxidised.

An equation must be balanced.

Crude Oil

Crude oil is a fossil fuels, formed over millions of years, with high temperatures and pressure.

It is formed from plankton, and can be drilled up from rocks.

It is a non-renewable and finite resource. They are being used up much faster than they are being formed.

Uses of Crude Oil

Oil is used for modern transport. This includes LPG, Heavy Fuel Oil, Diesel Oil and Kerosene.

All of the products from crude oil are organic compounds.

Fractional Distillation of Crude Oil

Crude oil is made out of hydrocarbons, mostly alkanes.

The oil is heated until most of it turns not a gas. It enters the fractionating column. ↓

There is a temperature gradient in the column. It is cooler at the top, and hotter at the bottom. ↓

The shorter hydrocarbons have the lowest boiling points and are condensed at the top. ↓

You end up with LPG, Petrol, Kerosene, Diesel Oil, Heavy Fuel Oil, and Bitumen.

Little (shortest chain) Penguins Keep Drinking Hot Beer

Alkenes

Alkenes have a C=C Double Bond, meaning that alkenes have two fewer hydrogens compare to alkanes.

Alkenes are **unsaturated**.

Alkenes are more reactive than alkanes due to the double bond being able to make a single bond.

Ethene, Propene, Butene and Pentene.

The General Formula is: H_nC_{2n}

To test for alkenes, you use bromine water, which turns from bright orange to colourless.

Alkenes can be used to produce polymers and may other chemicals.

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