

Section 1.5: Useful Products From Crude Oil

Cracking Crude Oil

- That long-chain hydrocarbons can be broken down into shorter, more useful hydrocarbons using a process known as cracking.
 - That some of the products that are made when long-chain molecules are cracked are useful as fuels, while others are useful as raw materials for making other substances, such as plastics.
 - That cracking is a type of thermal decomposition reaction (a reaction where molecules are broken down by heating them).
 - That the first step in the cracking process is to vaporise the long-chain hydrocarbon (turn it into a gas). The vapour is then passed over an aluminium catalyst at high temperatures (around 400 – 700 °C) or mixed with steam and heated to a very high temperature.
 - That cracking can be used to produce alkanes and alkenes.
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Using Crude Oil

- That using crude oil is bad for the environment because oil spills can occur when the oil is transported and burning crude oil contributes to global warming, global dimming and acid rain.
 - That crude oil is a non-renewable resource and will eventually run out.
 - Some of the advantages and disadvantages of using products from crude oil.
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Alkenes and Ethanol

- That alkenes are unsaturated hydrocarbons that contain a carbon-carbon double bond and have the general formula C_nH_{2n} .
 - That alkenes are described as unsaturated because the double bond can open up, allowing the two carbon atoms to bond with other atoms.
 - How to recognise alkenes like ethene and propene from their chemical and displayed formulae.
 - How bromine water can be used to test for the presence of alkenes in a solution.
 - That ethanol can be made by hydrating ethene with steam in the presence of a catalyst.
 - That ethanol can also be produced by fermenting sugars.
 - The relative advantages and disadvantages of using ethene and fermentation to produce ethanol.
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Using Alkenes to Make Polymers

- That many small alkene molecules (monomers) can be joined together to form long polymers.
- How to represent polymerisation reactions using diagrams and how to find the monomer that is used to make a particular polymer (and vice versa).
- How the properties of a polymer influence what the polymer is used for.
- That most polymers are non-biodegradable and this makes them difficult to dispose of.
- That new biodegradable polymers are being developed that contain cornstarch.