Hydrocarbons

* Crude oil contains hydrocarbons of different chain lengths
* There are intermolecular forces between the different chain length
* Intermolecular forces are forces between molecules
* The longer the chain the bigger the forces between molecules

Fractional distillation

* Different length hydrocarbons have different properties
* Longer chains have a higher b.p/m.p than shorter molecules
* More energy needed to over come the intermolecular forces compared to shorter chains
* More heat needed to turn the hydrocarbon fractions from a liquid to a solid

Polymerisation

* Some long chain hydrocarbons that do not have much use are split into smaller, more useful hydrocarbons e.g. Petrol
* A by-product of this process is an alkene e.g. Ethene
* Ethene is then used to make plastics in polymerisation
* During polymerisation, small ethene molecules, called **monomers** are joined together to form long chain molecules, called **polymers**
* **E.g. Ethene monomers join together to form polyethene**

Modifying polymers

* Plastics traditionally have **long chains** that can slide past each other, allowing the plastic to bend (flexible)
* Polymers can be modified to **increase chain length** to make the polymer stiffer and increase m.p
* Plastics with **weaker forces** have chains that slide past each other easily and have a low melting point
* Plastics with **stronger forces** have chains that stay in position and have a high melting point
* Polymer chains **packed tighter** together have a higher density than polymers packed **more loosely** together
* **Cross-linking** allows cross links to form between chains, making the polymer stiffer and increasing m.p
* **Plasticisers** will make a polymer softer, allowing it to be shaped easier and lowers the m.p
* (HT) a polymer can be made more **crystalline**. Branched chains are more bendy but crystalline polymers have **straight chains** so they pack closer together, making the polymer stronger, more dense and have a higher m.p