Fractional distillation

Crude oil is a mixture of many different compounds, mainly **hydrocarbons**. The hydrocarbon mixture is separated into **fractions** by **fractional distillation**.

The process

1. The **crude oil** is heated in a furnace to over 400ºC. At this temperature, most of the hydrocarbons in the crude oil mixture boil and turn into a gas.

2. The mixture of hot hydrocarbon gases passes into a **fractionating column** which is hotter at the bottom and cooler at the top.

3. The hot gases rise up the column. Once the temperature of the column falls below the boiling point of a hydrocarbon in the mixture, it is no longer hot enough for the hydrocarbon to stay in gaseous form. The gas therefore **condenses** and is separated off.

4. The **longer chain** hydrocarbons have a higher boiling point and condense towards the bottom of the column where it is hotter. The **shorter chain** hydrocarbons have a lower boiling point and remain as gases higher up, only condensing once a lower temperature is reached near the top of the column.

5. **Very short chain** hydrocarbons have a boiling point so low they do not condense within the fractionating column and are separated from the top of the column as gases.

Liquefied petroleum gases (LPG) or refinery gas Mainly consists of propane and butane and is used as bottled gas for cooking and heating

Petrol (gasoline) Used as a fuel for car engines

Kerosene Used as a fuel for jet engines in aircraft. Kerosene is also called paraffin in some areas of the world and is used in lamps.

Diesel Used as a fuel for cars, vans, lorries and trains

Fuel oil Used as a fuel for ships, for heating and in power stations

Residue (bitumen) Used to surface roads and for sealing roofs.

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