

Activity I – the chemical properties of each fraction

Word Bank

- Distillation
- Derivative
- Fraction
- Inverse
- Bio-diesel
- Viscosity

1

How many of the following oil fractions have you heard of? Circle all those that you have heard of, even if you are not sure what it is used for.

- Petroleum gas
- Diesel oil
- Naptha
- Lubricating oil
- Heavy fuel oils
- Bitumen
- Petrol
- Paraffin

2

Now think about the physical properties of each of those that you have heard of. Each has its own distinctive smell, appearance and viscosity (thickness). Label the following sliding scale to indicate which fraction is most viscous (thickest) and least viscous (i.e. thin, or easy to pour).



3

Each of the fractions below burns at a different temperature. This means that some have a 'lower boiling point' than others. The boiling range of each of these fractions is detailed in the table below.

Label the fractions in the illustration below with their respective boiling ranges.

Fraction	Boiling range	Number of carbon atoms per molecule
Petroleum gas	Below 40°C	1-4
Petrol	40-75°C	5-10
Naptha	75-160°C	7-14
Paraffin	160-250°C	11-16
Diesel oil	250-300°C	16-20
Lubricating oil	300-350°C	20-35
Heavy fuel oils	350-400°C	30-70
Bitumen	Above 400°C	More than 70

4

Describe the relationship between a fraction's viscosity and its boiling range.



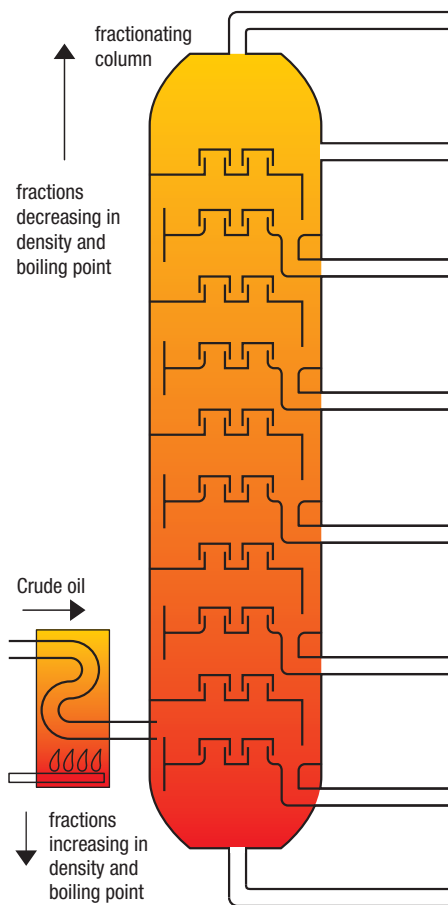


Activity 2 – Fractional Distillation

1

This is an illustration of a fractional distillation column, which works to the same principle as that in the video you have just watched.

- Without referring to the table you have just completed, see how many of the fractions (outputs) you can label.
- Now write / illustrate one use for each fuel against its name.



2

Each fraction is composed of differently-sized hydrocarbon molecules. The larger hydrocarbon molecules have higher boiling points and 'exit' from the bottom of the fractionating column. Describe the relationship between the size of the hydrocarbons and their respective boiling points.

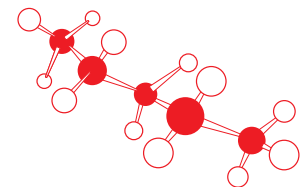


Figure 1: Hydrocarbon molecule

