



University Learning in Schools

Chemistry

**The Engineer's Guide to
Cleaning up an Oil Company's
Mess: How to make crude oil
useful and the chemistry of
hydrocarbons**

Lessons 1 and 2

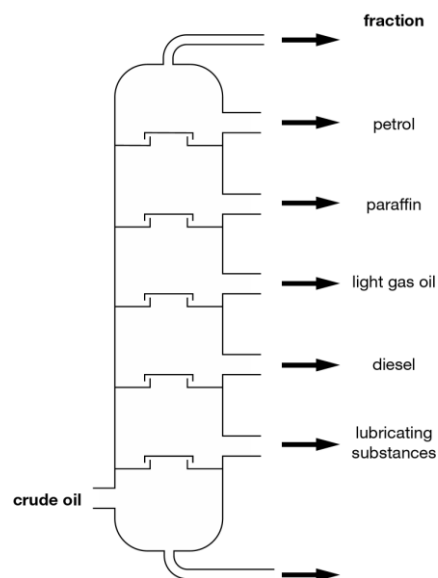


Task 1 - Separating crude oil

Fractional distillation separates crude oil into useful products called fractions.

The hydrocarbons in each fraction have similar boiling points because their hydrocarbons have similar sizes.

The top fractions have the shortest molecules and lowest boiling points.

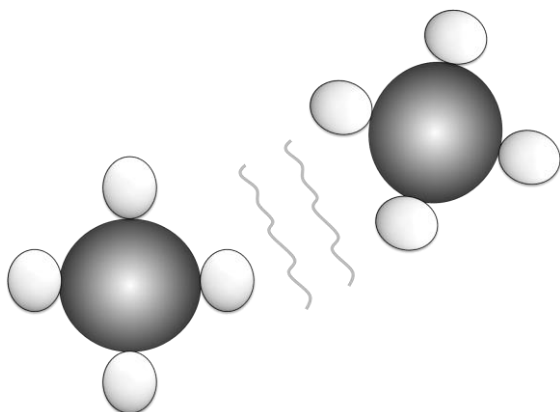


Fill in the missing words:

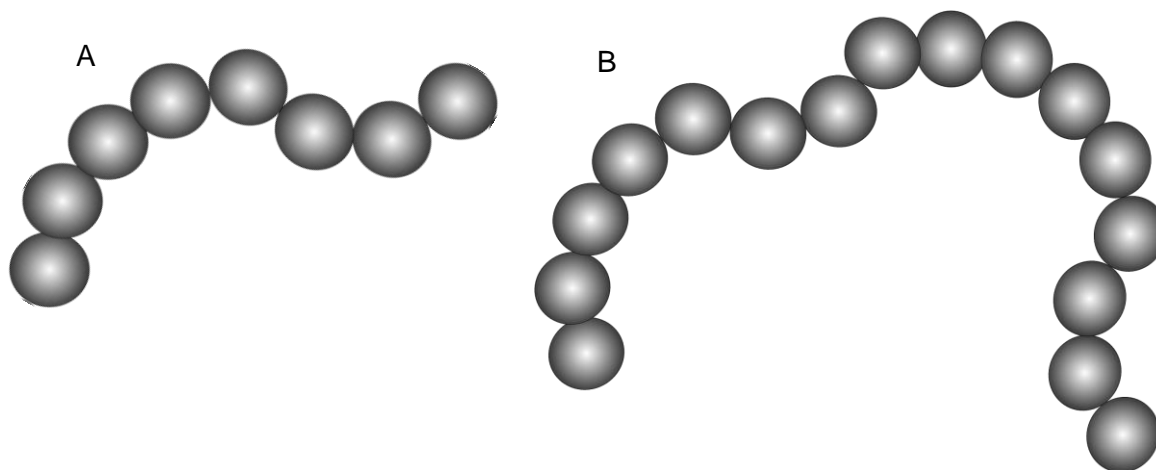
- The molecules in crude oil are _____.
Hydrocarbon molecules only contain _____ and _____ atoms.
 - The column separates oil into mixtures of similar _____ called fractions.
 - At the bottom of the column, the crude oil is _____.
 - Most of the oil _____ and rises up the column.
 - The column is _____ at the bottom and _____ at the top.
 - The fractions separate because they have different _____.
 - Fractions with high boiling points come out at the _____ of the column.
 - The label missing from the bottom of the column is _____.
 - Fractions with low _____ come out at the top of the column.
 - The label missing from the top of the column is _____.
 - Fossil fuels are finite resources because _____
-
- Non-renewable fuels like oil take a very _____ time to make and are used up _____ than they are formed.

Task 2 - How fractional distillation works

- a) The diagram shows two hydrocarbon molecules. Label a covalent bond and the intermolecular forces between the molecules. Say which is stronger.



- b) Chains of carbon atoms like these can be used to represent large hydrocarbon molecules. There are hydrogen atoms attached to each carbon atom but they are not shown in the diagram.



Match these descriptions to molecule A, molecule B, or both molecules:

- (i) A hydrocarbon.
- (ii) Found in petrol.
- (iii) Found in diesel.
- (iv) The molecule with the lowest boiling point.
- (v) The molecule with the strongest intermolecular forces.

c) Explain why the length of a hydrocarbon chain allows you to predict its boiling point.
