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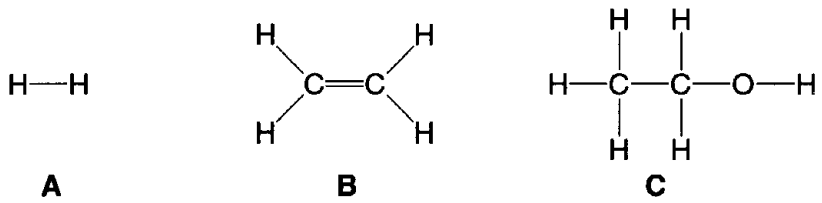
Core 1

Petroleum is a mixture of many different hydrocarbons.

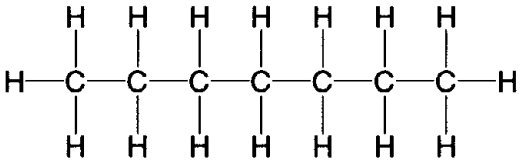
(a) Which **two** of the structures **A**, **B**, **C** and **D** are hydrocarbons?



A

B

C



D

structure 1 .....

structure 2 .....

[1]

(b) The mixture of hydrocarbons in petroleum is separated into different fractions.

(i) What is meant by the term *fraction*?

.....

.....[1]

(ii) What is the name of the process used to separate these fractions?

.....[1]

(iii) During this process, the mixture of hydrocarbons is vaporised and then condensed. Explain what is meant by

vaporised, ...

condensed. .....

[2]

(iv) The separation of the fractions depends on one physical property of the hydrocarbons.

State this property.

.....[1]

(c) Octane is a hydrocarbon which can be cracked to produce two different hydrocarbons, hexane and ethene.

$$\underset{\text{octane}}{C_8H_{18}} \rightarrow \underset{\text{hexane}}{C_6H_{14}} + \underset{\text{ethene}}{C_2H_4}$$

(i) State two conditions which are used to crack octane.

1. .....

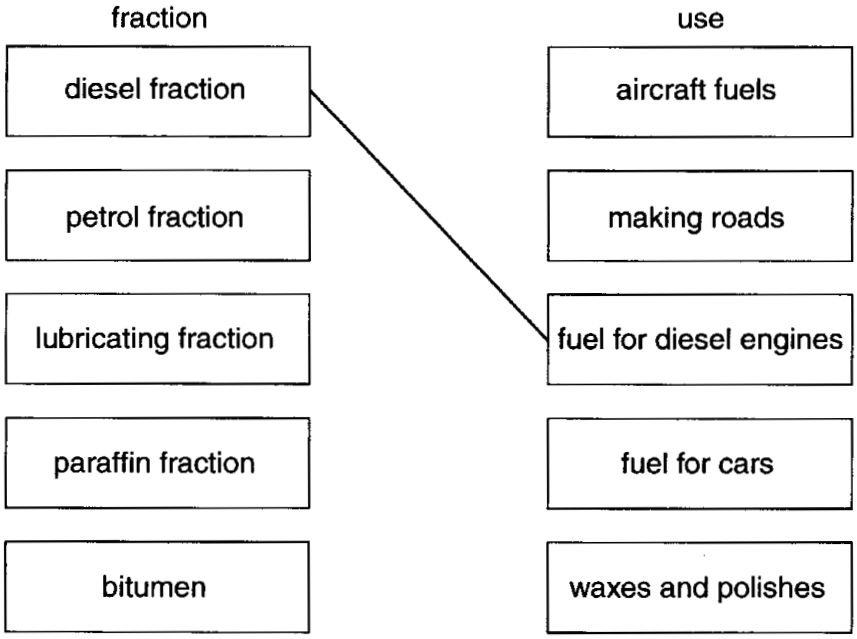
2. .....

[2]

(ii) Which of the three hydrocarbons in the equation above is used to make a polymer?

.....[1]

(d) In the diagram below, the boxes on the left give the names of some petroleum fractions. The boxes on the right show some uses of these fractions.
Draw lines between the boxes to link the fractions to their correct uses.
The first one has been done for you.



[4]

Core 1

a B and D

b(i) substance or group of substances with a specific boiling range or condensed at a similar temperature

(ii) distillation / fractional distillation / fractionation

(iii) vaporised change of state to gas / vapour state

condensed change of state from gas / vapour to liquid

(iii) boiling point

c(i) high temperature and catalyst

(ii) ethene / C_2H_4

d petrol → fuel for cars

lubricating fraction → waxes and polishes

paraffin → aircraft fuels

bitumen → making roads