Knowledge check

Subject area: Organic chemistry | **Level: 14–16 years (Higher)**

Topic: Hydrocarbons | **Source: rsc.li/34Fv93j**

1. Crude oil is a complex mixture of compounds called hydrocarbons.

Hydrocarbon molecules may be either straight chain or ring structures.

Carbon atoms have 4 covalent bonds.
Hydrogen atoms have 1 covalent bond.

a) Draw structures showing all bonds for the following hydrocarbons.

Methane, CH_4	**Propane, C_3H_8**
Pentane, C_5H_{12}	**Butane, C_4H_{10}**

b) Give the molecular formula and structure of the missing molecule in part a).

c) Place the four molecules in part a) in order of boiling point, lowest first.

All of the hydrocarbons shown in part a) belong to a homologous series.
These hydrocarbons are also saturated.

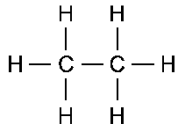
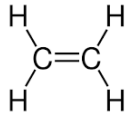
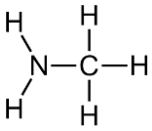
d) What is the name of the homologous series?

e) What is the meaning of the term 'saturated'?

f) What is the general formula of the alkanes?

2. Use the names, formulae or structures to work out which of the molecules are hydrocarbons and which are alkanes.

Place a tick or cross in the box.

	Hydrocarbon	Alkane
H_2O		
C_5H_{12}		
C_4H_8		
C_2H_5OH		
Pentane		
		
		
		

3. This is a hydrocarbon puzzle.

Write down the molecular formula of the alkane using the following clues.

a) It contains 5 carbon atoms.

b) It contains 18 hydrogen atoms.

c) It contains 6 carbon-carbon single bonds per molecule.

d) It has the highest boiling point of the first 10 alkanes.

e) A molecule known as centane.