

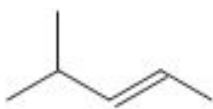
WJEC Chemistry A-level

C3.1: Organic Compounds

Practice Questions

England Specification

1. The skeletal formula of a hydrocarbon is shown below.



Give the **systematic name** of this hydrocarbon.

(Total 1)

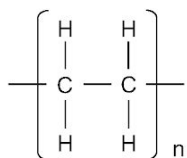
2.

The following table shows information about some organic compounds.

Name	Molecular formula	Structural formula
ethene	C_2H_4	$\begin{array}{c} H & & H \\ & \diagdown & / \\ & C = C \\ & / & \diagdown \\ H & & H \end{array}$
propane	C_3H_8	
hexane		$\begin{array}{cccccc} H & H & H & H & H & H \\ & & & & & \\ H-C & -C & -C & -C & -C & -C-H \\ & & & & & \\ H & H & H & H & H & H \end{array}$
	CH_4	$\begin{array}{c} H \\ \\ H-C-H \\ \\ H \end{array}$

(a) Complete the table by filling all **three** empty boxes. [3]

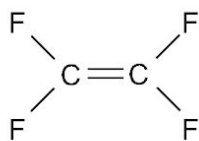
(b) (i) Name the compound from the table above that can be used to form the polymer represented by the following structure. [1]



Compound

(ii) Small reactive molecules, such as alkenes, that join together to form polymers are known as [1]

(c) Another polymer can be formed from the following compound.



(i) Choose from the box below the name of the polymer produced from this compound.

[1]

polyethene	polypropene	polyvinylchloride
polytetrafluoroethene	polystyrene	

Polymer

(ii) Draw the repeating unit for this polymer.

[1]

7

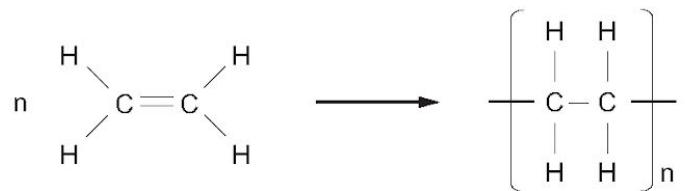
3.

The following table shows some information about four organic compounds.

Name	Molecular formula	Structural formula	Family of hydrocarbons
methane		$\begin{array}{c} \text{H} \\ \\ \text{H}-\text{C}-\text{H} \\ \\ \text{H} \end{array}$	
butane	C_4H_{10}		alkane
ethene	C_2H_4	$\begin{array}{c} \text{H} \quad \quad \text{H} \\ \diagdown \quad \diagup \\ \text{C}=\text{C} \\ \diagup \quad \diagdown \\ \text{H} \quad \quad \text{H} \end{array}$	
	C_3H_6	$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\ \quad \quad \\ \text{H}-\text{C}-\text{C}=\text{C} \\ \quad \quad \\ \text{H} \quad \quad \text{H} \end{array}$	alkene

(a) Complete the table. [4]

(b) Ethene undergoes polymerisation to form polythene. The following equation shows the reaction taking place.



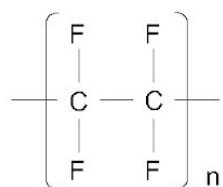
Describe what happens during this process. [2]

.....

.....

.....

(c) Another polymer is PTFE. Its repeating unit is shown below.



Draw the structure of the monomer used to produce PTFE.

[1]

4.

- (a) The table below shows the names, molecular formulae and the structural formulae of the first two members of the alkene series. Complete the table by giving the structural formula of butene, C_4H_8 . [1]

Name	Molecular formula	Structural formula
ethene	C_2H_4	$ \begin{array}{c} H & H \\ & \\ C & = & C \\ & & \\ H & & H \end{array} $
propene	C_3H_6	$ \begin{array}{c} H & & H \\ & & \\ H - C & - & C = C \\ & & & \\ H & & H & H \end{array} $
butene	C_4H_8	

- (b) Explain how polypropene is formed from propene. [4]

.....

.....

.....

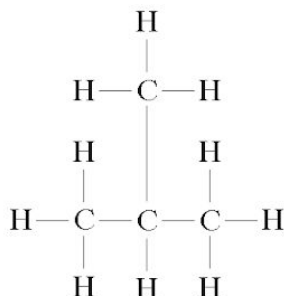
.....

.....

.....

5.

(a) Give the **molecular** formula of the substance with the structural formula shown below.



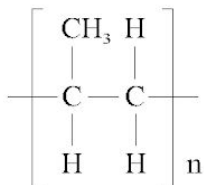
Molecular formula [1]

(b) Give the name and the **structural** formula of the hydrocarbon with the molecular formula C_3H_8 . [2]

Name

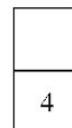
Structural formula

(c) Polypropene is represented as shown below.



Give the **molecular** formula of the monomer used to make polypropene. [1]

Molecular formula



6.

Organic substances are arranged in families of compounds with similar properties.

- (a) The table below shows the first four members of two families of organic compounds, alkanes and alcohols.

Alkanes	Alcohols
methane CH_4	methanol CH_3OH
ethane C_2H_6	ethanol $\text{C}_2\text{H}_5\text{OH}$
propane C_3H_8	propanol $\text{C}_3\text{H}_7\text{OH}$
butane C_4H_{10}	butanol $\text{C}_4\text{H}_9\text{OH}$

The general formula for members of the alkane family is $\text{C}_n\text{H}_{2n+2}$.

Give the general formula for members of the alcohol family. [1]

- (b) Isomers are compounds which have the same molecular formula but different structural formulae.

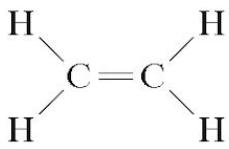
Propanol has two isomers. Draw the two positional isomers of propanol. [2]

Isomer 1	Isomer 2
----------	----------

(c) Another family of organic compounds is the alkene family.

Complete the table below.

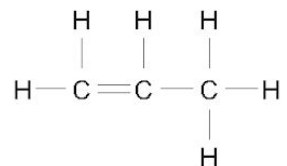
[2]

Name	Molecular formula	Structural formula
ethene	C_2H_4	
	C_3H_6	

5

7.

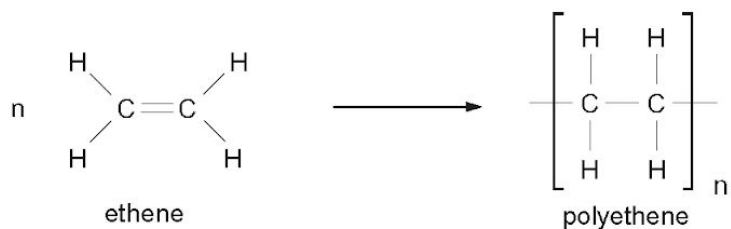
- (a) The following diagram shows the structural formula of propene.



Give the molecular formula of propene. [1]

- (b) An alkane contains three carbon atoms and eight hydrogen atoms. Draw its structural formula. [1]

- (c) The equation below shows the formation of polyethene from ethene.



Describe what happens to ethene molecules during the formation of polyethene. [3]

.....

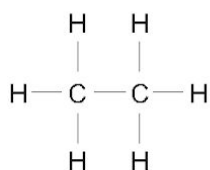
.....

.....

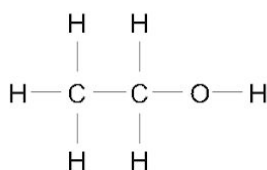
.....

8.

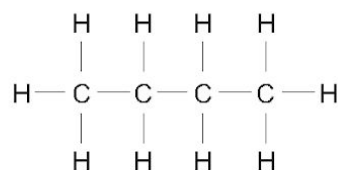
(a) The structural formulae of some organic compounds are shown below.



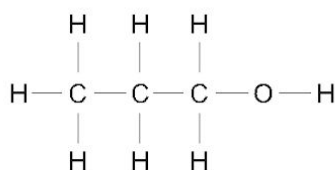
A



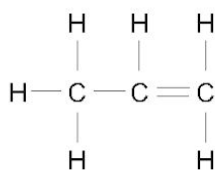
B



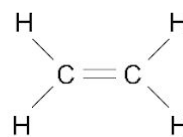
C



D



E



F

(i) Give the letters, **A-F**, of two alkanes and two alcohols. [2]

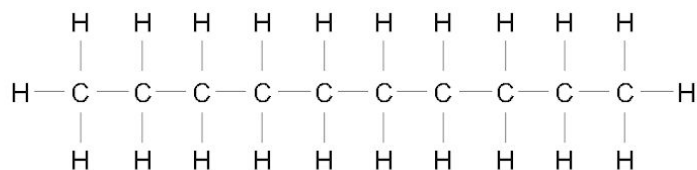
Alkanes and

Alcohols and

(ii) State which compound, **A-F**, has the molecular formula C_3H_6 . [1]

.....

(b) Give the molecular formula of decane. [1]

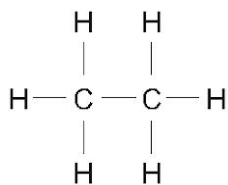


.....

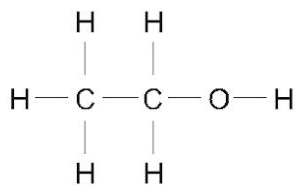
4

9.

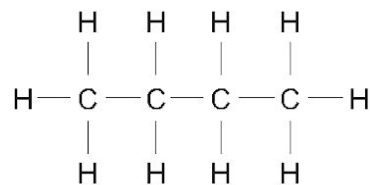
The following diagram shows the structures of six organic compounds.



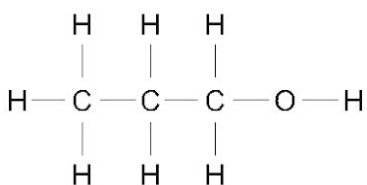
A



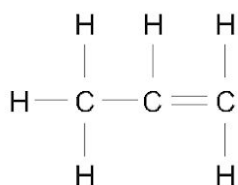
B



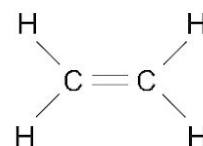
C



D



E



F

(a) Name the family to which each of the following pairs of compounds belong. [2]

B and D

E and F

(b) Describe a chemical test that could be carried out to distinguish between compounds **C** and **E**. Give the expected result for both compounds. [2]

.....

.....

.....

.....

(c) Compound C is one of two isomers that have the molecular formula C_4H_{10} .

(i) Give the meaning of the term *isomer*. [1]

.....
.....

(ii) Draw in the space below the structure of the other isomer of C_4H_{10} . [1]

(d) Give the letter, A-F, of one *other* compound that has an isomer. Draw the structure of its isomer. [2]

Compound

Structure

10.

- (a) (i) The table below shows the names, molecular formulae and structural formulae of some alkanes.

Complete the table.

[2]

Name	Molecular formula	Structural formula
methane	CH_4	
ethane	<pre> H H H-C---C-H H H </pre>
propane	C_3H_8	<pre> H H H H-C---C---C-H H H H </pre>
butane	C_4H_{10}	<pre> H H H H H-C---C---C---C-H H H H H </pre>

- (ii) Octane contains 8 carbon atoms. Give the molecular formula for octane.

[1]

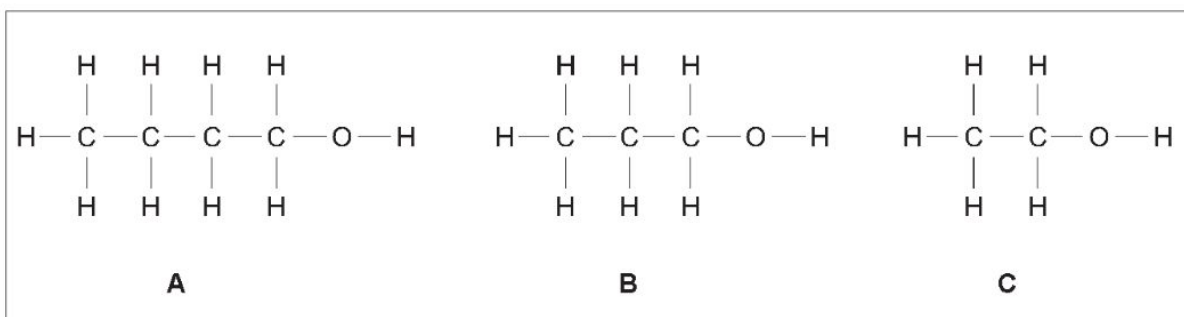
.....

- (b) (i) Compound X is made by a process called fermentation. The equation below shows the reaction that occurs.



Give the name of compound X. [1]

- (ii) Choose from the box below the structural formula, **A**, **B** or **C**, of compound X. [1]



Letter

- (iii) Give one everyday use of compound X. [1]

.....

6