

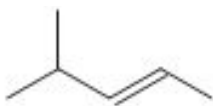
# **WJEC Chemistry AS-level**

## 2.4: Organic Compounds

### Practice Questions

England Specification

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



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

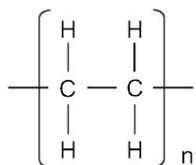
(Total 1)

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]

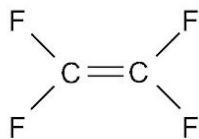
(b) (i) Name the compound from the table above that can be used to form the polymer represented by the following structure. [1]



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

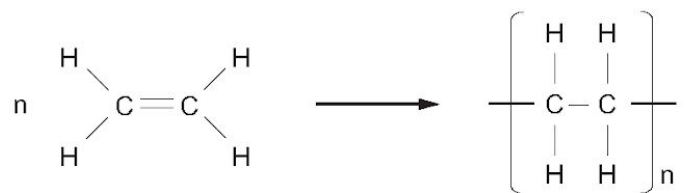
3.

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	$\text{C}_4\text{H}_{10}$		alkane
ethene	$\text{C}_2\text{H}_4$	$\begin{array}{c} \text{H} \quad \quad \text{H} \\ \diagdown \quad \diagup \\ \text{C}=\text{C} \\ \diagup \quad \diagdown \\ \text{H} \quad \quad \text{H} \end{array}$	
	$\text{C}_3\text{H}_6$	$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\   \quad   \quad   \\ \text{H}-\text{C}-\text{C}=\text{C} \\   \quad \quad   \\ \text{H} \quad \quad \text{H} \end{array}$	alkene

(a) Complete the table. [4]

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



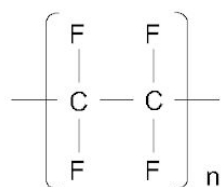
Describe what happens during this process. [2]

.....

.....

.....

(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	$C_2H_4$	<pre>       H   H                   C=C                   H   H           </pre>
propene	$C_3H_6$	<pre>           H       H                           H - C - C = C                               H   H   H           </pre>
butene	$C_4H_8$	

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

.....

.....

.....

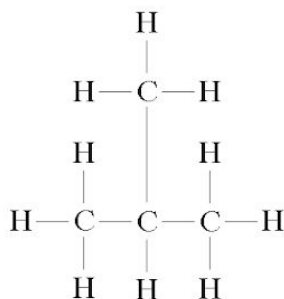
.....

.....

.....

5.

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



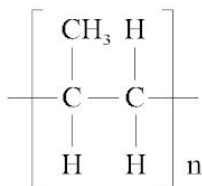
*Molecular formula* ..... [1]

(b) Give the name and the **structural** formula of the hydrocarbon with the molecular formula  $\text{C}_3\text{H}_8$ . [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* .....

4

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 $\text{CH}_4$	methanol $\text{CH}_3\text{OH}$
ethane $\text{C}_2\text{H}_6$	ethanol $\text{C}_2\text{H}_5\text{OH}$
propane $\text{C}_3\text{H}_8$	propanol $\text{C}_3\text{H}_7\text{OH}$
butane $\text{C}_4\text{H}_{10}$	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]

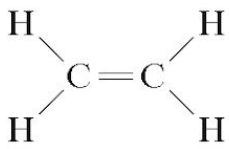
Isomer 1	Isomer 2
----------	----------



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

Complete the table below.

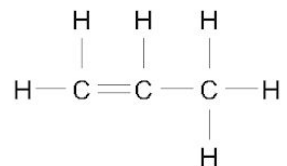
[2]

Name	Molecular formula	Structural formula
ethene	$C_2H_4$	
	$C_3H_6$	

5

7.

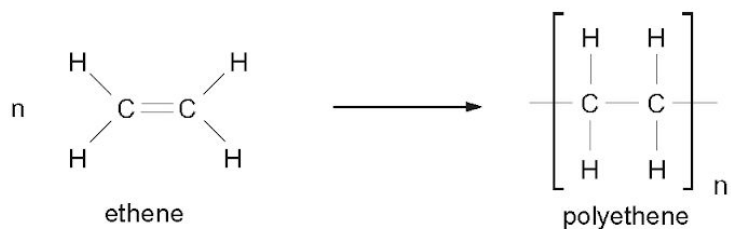
- (a) The following diagram shows the structural formula of propene.



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]

.....

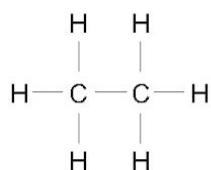
.....

.....

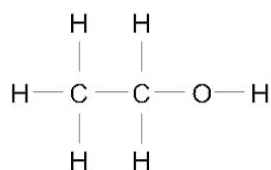
.....

8.

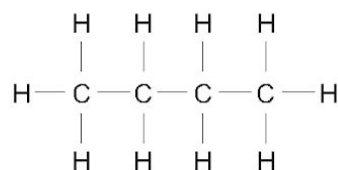
(a) The structural formulae of some organic compounds are shown below.



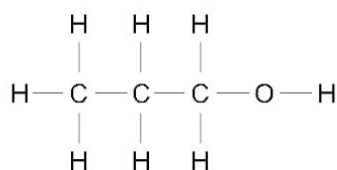
**A**



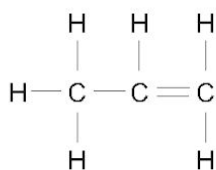
**B**



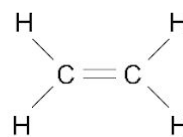
**C**



**D**



**E**



**F**

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

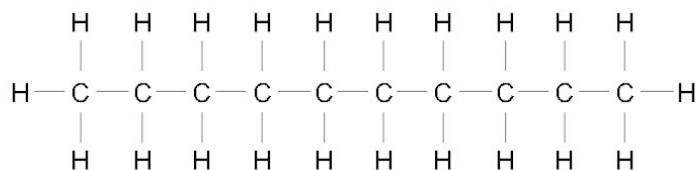
*Alkanes* ..... and .....

*Alcohols* ..... and .....

(ii) State which compound, **A-F**, has the molecular formula  $\text{C}_3\text{H}_6$ . [1]

.....

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

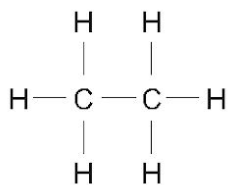


.....

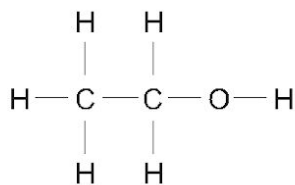
4

9.

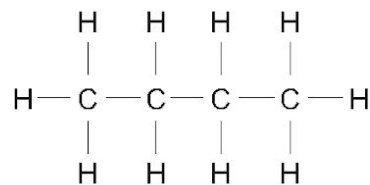
The following diagram shows the structures of six organic compounds.



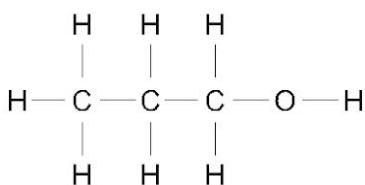
**A**



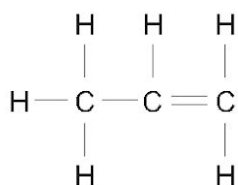
**B**



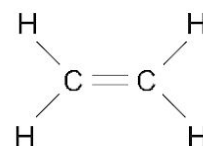
**C**



**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]

.....

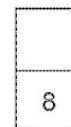
.....

(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	$\text{CH}_4$	
ethane	.....	<pre>       H   H             H — C — C — H                   H   H           </pre>
propane	$\text{C}_3\text{H}_8$	<pre>       H   H   H                 H — C — C — C — H                       H   H   H           </pre>
butane	$\text{C}_4\text{H}_{10}$	<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]

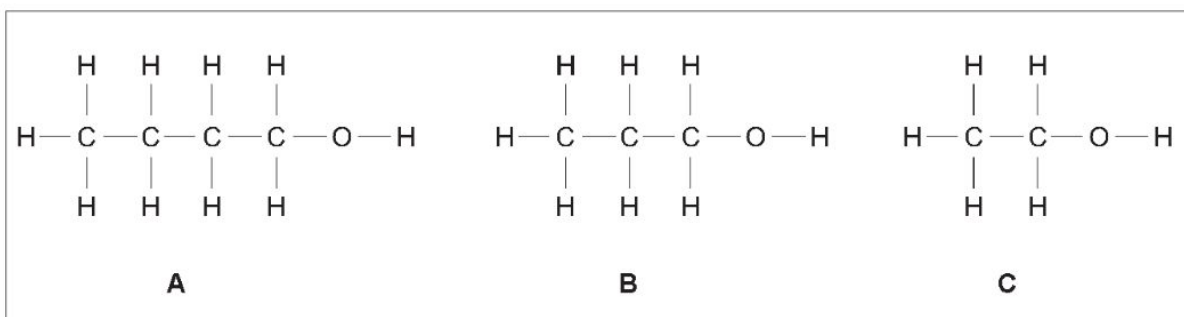
.....

- (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