

GCSE Chemistry - Chemistry - Key Stage 4

Organic chemistry

# Alcohols

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# Warm up

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A group of atoms/bonds that determine the chemical properties of a substance (e.g. C=C double bond)

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A group of molecules with the same functional group (e.g. alkenes and alkanes)

\_\_\_\_\_

Describes a molecule that contains at least one double bond.

**Unsaturated**

**Homologous series**

**Functional group**



# Independent practice

1. State two uses of alcohols.
2. What is the functional group found in alcohols?
3. What is a homologous series?
4. Name the first 4 alcohols in order.
5. What is the general formula for an alcohols?
6. What do the names of all alcohols end in?

Challenge:

An alcohol has 10 carbons. State it's molecular formula and name it.



# Independent practice

Complete the table:

Name	Molecular formula	Displayed formula	Challenge: Structural formula
Methanol	$\text{CH}_3\text{OH}$		$\text{CH}_3\text{OH}$
		$\begin{array}{c} \text{H} & \text{H} \\   &   \\ \text{H}-\text{C}- & \text{C}-\text{O}-\text{H} \\   &   \\ \text{H} & \text{H} \end{array}$	



# Independent practice

For the **first 4 alcohols** in the homologous series write down/draw:

Name	Molecular formula	Displayed formula	Challenge: Structural formula
	$\text{C}_3\text{H}_7\text{OH}$		$\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
Butanol			



# Independent practice

1. Describe the method of hydration
2. Describe the method of fermentation



# Pause point - evaluating fermentation

Advantage/disadvantage	Why is it an advantage/disadvantage?
Sugar cane is renewable	
Fermentation is low energy compared to hydration	
Sugar cane absorbs CO <sub>2</sub> during photosynthesis	
Lots of steps	
Ethanol from sugar cane is only 50% pure	
Sugar cane has to be grown	



# Answers - evaluating fermentation

Advantage/disadvantage	Why is it an advantage/disadvantage?
Sugar cane is renewable	<b><u>So</u></b> saves resources
Fermentation is low energy compared to hydration	So saves fuel, releases less carbon dioxide into the atmosphere, less global warming
Sugar cane absorbs CO <sub>2</sub> during photosynthesis	So doesn't contribute to global warming.
Lots of steps	So a slow process that lots of time/labour intensive
Ethanol from sugar cane is only 50% pure	So would need more processes/steps to purify
Sugar cane has to be grown	<b><u>So</u></b> uses land that could be used to grow food/ destroys habitats



# Pause point - evaluating hydration

Advantage/disadvantage	Why is it an advantage/disadvantage?
Uses crude oil which is non-renewable	
High energy process	
Continuous process and quicker	
The ethanol produced is 100% pure	



# Answers - evaluating hydration

Advantage/disadvantage	Why is it an advantage/disadvantage?
Uses crude oil which is non-renewable	So will run out
High energy process	So requires the burning of fossil fuels which releases carbon dioxide and contributes to global warming
Continuous process and quicker	So is less labour intensive than fermentation
The ethanol produced is 100% pure	doesn't require further processes to purify further



# Evaluating hydration and fermentation

**Evaluate** the advantages and and disadvantages of hydration and fermentation.

