

(Alcohols (properties, uses, reactions))

Q1.(2018)

Describe how ethanol is produced from sugar solution.

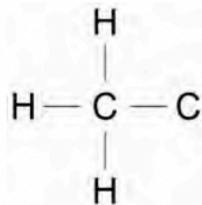
Give the name of this process.

[3 marks]

Q2.(2018)

Figure 9 shows part of the displayed formula for ethanol.Complete **Figure 9**.

[1 mark]

Figure 9

Q3.(2018)

Name the gas produced when sodium is added to ethanol.

[1 mark]

Q4.(2018)

Methanol is used to produce methanoic acid.

What type of substance reacts with methanol to produce methanoic acid?

[1 mark]

Q5.(2019)

Propene reacts with water (steam) to make propanol.

The ratio of the masses of propene and water that react is:

propene : water

7 : 3

Calculate the mass of propene that reacts with 21 g water.

[2 marks]

Mass = _____ g

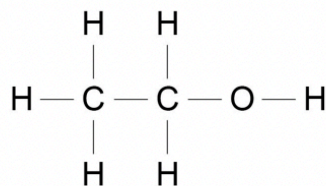
Q6.a)(2020)

This question is about ethanol and ethanoic acid.

Ethanol is an alcohol.

Figure 7 shows the displayed structural formula of ethanol.

Figure 7



Draw a circle on **Figure 7** around the alcohol functional group.

[1 mark]

Q6.b)(2020)

An ethanol molecule contains atoms of three different elements.

Complete **Table 5** to show:

- the name of each element
- the symbol for each element
- the number of atoms of each element in one molecule of ethanol.

Use **Figure 7**.

Table 5

[3 marks]

Name of element	Symbol for element	Number of atoms in one molecule of ethanol
Carbon	C	
Hydrogen		6
	O	1

Q7.(2020)

Ethanol removes grass stains from clothes.

What type of substance is ethanol when used to remove grass stains?

[1 mark]

Tick (✓) **one** box.

A solute

☐

A solution

☐

A solvent

☐

Q8.(2020)

Wine contains ethanol.

Wine is produced from grape juice by fermentation.

Complete the sentence.

[1 mark]

Grape juice can be fermented to produce wine because

grape juice contains _____.

Q9.(2020)

What is added to grape juice to cause fermentation?

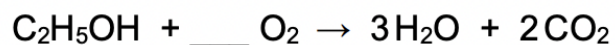
[1 mark]

Q10.(2021)

Ethanol burns in oxygen.

Balance the equation for the reaction.

[1 mark]



Q11.(2021)

Two processes for producing ethanol are:

- fermentation
- hydration (reacting ethene with steam).

Table 5 shows information about the processes.

Table 5

Feature	Process	
	Fermentation	Hydration
Raw material	sugar	crude oil
Energy usage	low	high
Rate of reaction	slow	fast
Purity of ethanol	15%	98%

Give **two** advantages and **two** disadvantages of using fermentation to produce ethanol.

[4 marks]

Advantage of fermentation 1 _____

Advantage of fermentation 2 _____

Disadvantage of fermentation 1 _____

Disadvantage of fermentation 2 _____

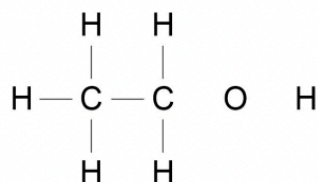
Q12.(2022)

This question is about ethanol.

The formula of ethanol is $\text{C}_2\text{H}_5\text{OH}$

Complete the displayed structural formula of ethanol.

[1 mark]



Q13.(2022)

Which is **one** use of ethanol?

[1 mark]

Tick (✓) **one** box.

As a protective coating on aluminium

☐

In hand gel to kill microbes

☐

To test for the presence of hydrogen gas

☐

Q14.(2022)

Ethanol can be produced from sugar solution by fermentation.

What must be added to sugar solution to produce ethanol?

[1 mark]

Q15.a)(2023)

This question is about alcohols and carboxylic acids.

Alcohols are used as fuels.

A student burned 1.00 g of six alcohols and determined the energy released from each.

Table 8 shows the results.

Table 8

Alcohol	Formula of one molecule of the alcohol	Energy released in kJ/g
Ethanol	$\text{C}_2\text{H}_5\text{OH}$	29.6
Propanol	$\text{C}_3\text{H}_7\text{OH}$	33.6
Butanol	$\text{C}_4\text{H}_9\text{OH}$	36.1
Pentanol	$\text{C}_5\text{H}_{11}\text{OH}$	37.7
Hexanol	$\text{C}_6\text{H}_{13}\text{OH}$	38.9
Heptanol	$\text{C}_7\text{H}_{15}\text{OH}$	39.8

Calculate the mass of ethanol that must be burned to release the same amount of energy as burning 1.00 g of heptanol.

[2 marks]

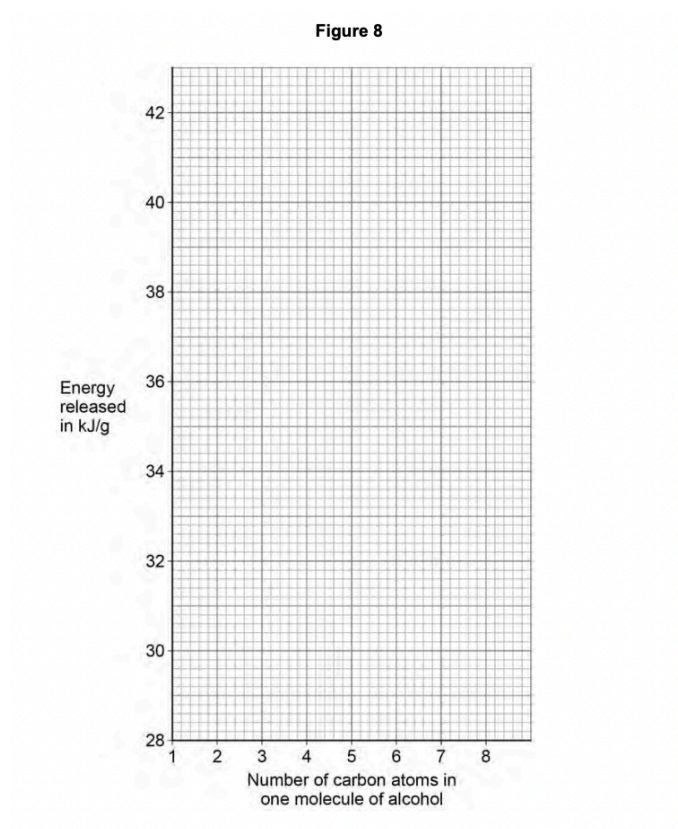
Mass = _____ g

Q15.b)(2023)

The energy released in kJ/g varies with the number of carbon atoms in one molecule of each alcohol.

Plot the data from **Table 8** on **Figure 8**.

[2 marks]



Q15.c)(2023)

Estimate the energy released in kJ when 1.00 g of octanol ($C_8H_{17}OH$) is burned.

Use **Figure 8**.

[1 mark]

Energy released = _____ kJ

Q15.d)(2023)

Carbon dioxide is produced when alcohols are burned.

Carbon dioxide is identified by bubbling the gas through limewater.

Complete the sentence.

Choose the answer from the box.

[1 mark]

calcium chloride	calcium hydroxide	calcium nitrate	calcium sulfate
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Limewater is an aqueous solution of _____.

Q15.e)(2023)

Give the result of the test when carbon dioxide is bubbled through limewater.

[1 mark]
