

11.6 Alcohols

Name: _____ Class: _____ Date: _____

Total: 9 marks**KEY WORDS** ethanol • fermentation • glucose • alcohols • yeast

Objective

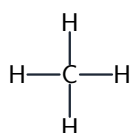
Build the skills to answer exam questions on **alcohols** – the –OH group, **ethanol**, the two ways to make it (**fermentation** and addition of steam to ethene), and its uses.

You must be able to:

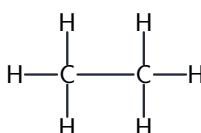
- describe alcohols (–OH group) and ethanol
- compare fermentation with the catalytic addition of steam to ethene
- state the uses of ethanol

1 Key knowledge and worked examples

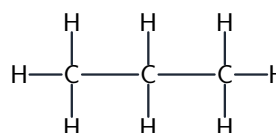
■ Making ethanol



methane
CH₄



ethane
C₂H₆



propane
C₃H₈

each step adds a CH₂ unit general formula C_nH_{2n+2}

Alcohols contain the –OH functional group; ethanol is the key example

Method	Conditions	Notes
fermentation of glucose	yeast, 25–35 °C, no air	renewable, slow, impure
steam + ethene	300 °C, 60 atm, acid catalyst	fast, pure, non-renewable

2 Practice

2.1 State the functional group in an alcohol. [1]

2.2 Name the two products of fermentation of glucose. [2]

3 Exam-style questions

3.1 A use of ethanol is as a: [1]

- ☐ **A** metal
B solvent and fuel
C fertiliser
D catalyst

3.2 Ethanol can be made by fermentation or by adding steam to ethene.

(a) Give one advantage of making ethanol by fermentation. [1]

(b) Give one advantage of making ethanol from ethene. [1]

3.3 State the conditions needed for fermentation. [3]

Solutions

Each answer shows the steps, then the **result**.

2.1

- the alcohol functional group is **–OH** (hydroxyl)

2.2

- fermentation of glucose: **ethanol** and **carbon dioxide**

3.1 B

- ethanol is used as a **solvent and a fuel**
- A, C and D are not uses of ethanol

3.2

(a)

- fermentation uses **renewable sugar**

(b)

- the ethene route is **fast** and gives **pure ethanol**

3.3

- **yeast**
- about 25–35 °C
- **absence of air/oxygen**