

11.6 Alcohols

Name: _____ Class: _____ Date: _____

Total: 9 marks**KEY WORDS** ethanol 乙醇 • glucose 葡萄糖 • fermentation 发酵 • alcohols 醇 • solvent 溶剂

Objective

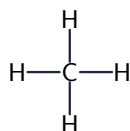
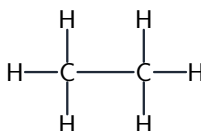
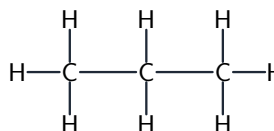
Build the skills to answer exam questions on **alcohols** 醇 — the -OH group, **ethanol** 乙醇, the two ways to make it (**fermentation** 发酵 and addition of steam to ethene), and its uses.

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 Worked examples

■ Making ethanol

methane
 CH_4 ethane
 C_2H_6 propane
 C_3H_8 each step adds a CH_2 unit general formula $\text{C}_n\text{H}_{2n+2}$

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

Method	Conditions	Notes
fermentation of glucose	yeast, $25\text{--}35\text{ }^\circ\text{C}$, no air	renewable, slow, impure
steam + ethene	$300\text{ }^\circ\text{C}$, 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

2.1 –OH (the hydroxyl group).

2.2 ethanol; carbon dioxide.

3.1 B. Ethanol is used as a solvent and a fuel.

3.2 (a) it uses renewable sugar.

(b) it is fast and gives pure ethanol.

3.3 yeast; a temperature of about 25–35 °C; in the absence of air/oxygen.