

Exercise walk-through

Alcohols ■ 11.6

eXercise

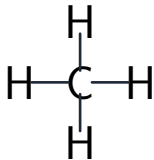
You must be able to

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

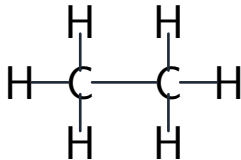
Method — Making ethanol

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

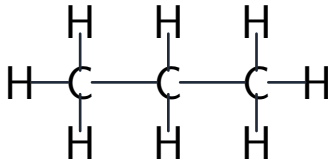
Method — Making ethanol



methane
 CH_4



ethane
 C_2H_6



propane
 C_3H_8

each step adds a CH_2 unit

general formula $\text{C}_n\text{H}_{2n+2}$

Alkanes/alcohols as a homologous series

Practice 2.1 ■ 1 mark

State the functional group in an alcohol.

Solution 2.1

Method: Making ethanol

Worked steps

–OH (the hydroxyl group) **B1**.

Practice 2.2 ■ 2 marks

Name the two products of fermentation of glucose.

Solution 2.2

Method: Making ethanol

Worked steps

ethanol **B1**; carbon dioxide **B1**.

Exam-style 3.1 ■ 1 mark

A use of ethanol is as a:

A metal

B solvent and fuel

C fertiliser

D catalyst

Solution 3.1

A metal

B solvent and fuel



C fertiliser

D catalyst

Worked steps

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

Exam-style 3.2 ■ 1 mark

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

- (a) Give one advantage of making ethanol by fermentation.
- (b) Give one advantage of making ethanol from ethene.

Solution 3.2

Method: Making ethanol

Worked steps

- (a) it uses renewable sugar **B1**.
- (b) it is fast and gives pure ethanol **B1**.

Exam-style 3.3 ■ 3 marks

State the conditions needed for fermentation.

Solution 3.3

Method: Making ethanol

Worked steps

yeast **M1**; a temperature of about 25–35 °C **M1**; in the absence of air/oxygen **A1**.