

## Knowledge check

Subject area: Organic chemistry

Level: 14–16 years (Foundation)

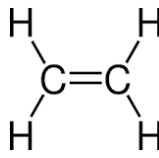
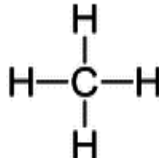
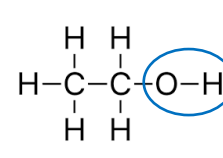
Topic: Alcohols

 Source: [rsc.li/3ntOcpM](https://www.rsc.li/3ntOcpM)

1. These three molecules include an alkane, an alkene and an alcohol.

a) State which molecules belong to which group.

Write your answer underneath each molecular structure.

		
<i>Answer: Alkene: ethene.</i>	<i>Answer: Alkane: methane.</i>	<i>Answer: Alcohol: ethanol.</i>

b) Name each of the substances in part a).

Write your answer in the same boxes.

*Answer: See answers above.*

c) Indicate the alcohol functional group on one of the molecules shown.

*Answer: See diagram of ethanol in which the O-H (hydroxyl) group is circled.*

d) Use the molecular structure of ethanol to write down the chemical formula for ethanol.

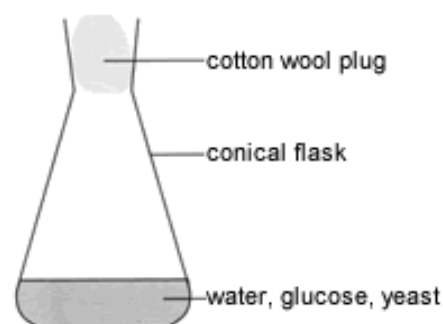
*Answer: C<sub>2</sub>H<sub>5</sub>OH, or C<sub>2</sub>H<sub>6</sub>O.*

2. Janice and Matt set up this equipment then waited for one week.

A chemical reaction takes place in which new substances are made.

a) Complete the word equation for this reaction:

Glucose → *ethanol* + carbon dioxide



b) What is the name given to the type of reaction taking place?

*Answer: Fermentation.*

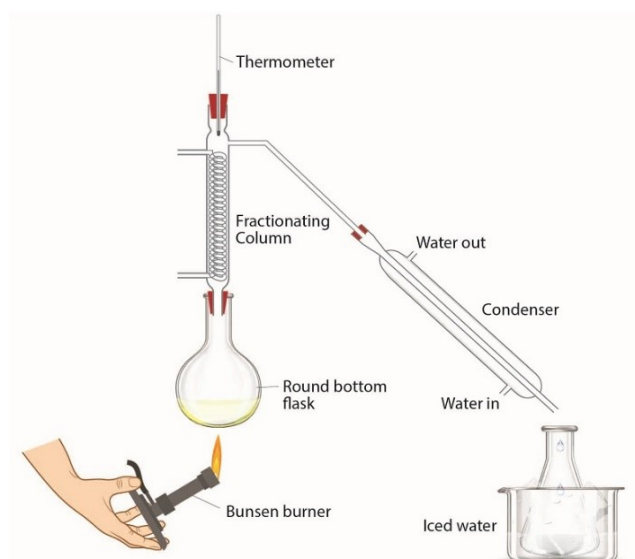
c) Explain why yeast is used in the experiment.

*Answer: Yeast contains an enzyme that makes the fermentation happen at a faster rate.*

Janice and Matt then add the mixture from the conical flask to the round-bottom flask in a different experiment.

d) What is the purpose of this new experiment?

*Answer: To separate the ethanol from the aqueous solution.*



Source: Royal Society of Chemistry

e) Explain how this experiment works.

*Answer: Ethanol has a lower boiling point than water, so is able to form a vapour that can be removed and condensed.*

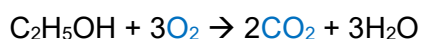
f) What is the name of this technique or experiment?

*Answer: Fractional distillation.*

- g) Janice and Matt add a small sample of the ethanol they have made and add it to a crucible.

They add a lighted splint to the ethanol and notice that it catches fire.

Complete the equation to show what happens when ethanol burns:



3. Ravi carries out an experiment with a mixture of ethanol dissolved in water.

He leaves the ethanol open to the air for two weeks.

He notices that a very slow chemical reaction takes place.

He removes a few drops of his new mixture and adds some universal indicator solution.

He notices that the indicator turns orange.

- a) What type of substance has formed?

*Answer: A weak acid.*

- b) What is the name of the new organic product formed?

*Answer: Ethanoic acid.*

- c) State the name of the chemical substance that reacts with ethanol in this reaction.

*Answer: Oxygen.*

- d) What type of reaction has taken place?

*Answer: Oxidation.*

- e) Complete the diagram to show the structure of the new organic product made.

