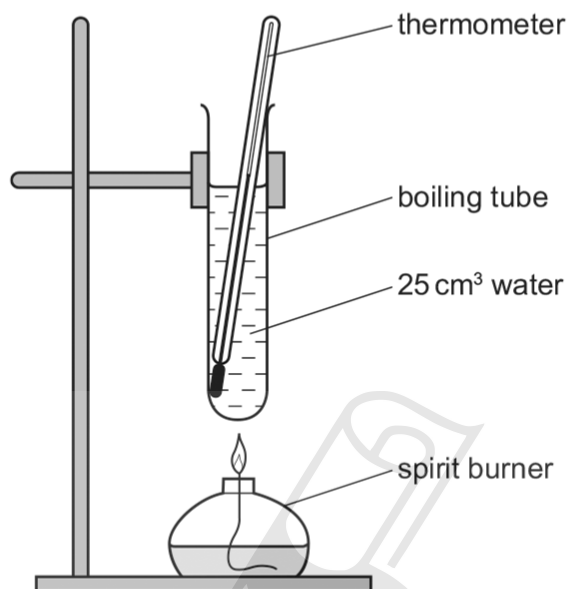


13.3 Alcohols

01.0620_s12_qp_61 Q: 2

Heat is given out when alcohols are burned.

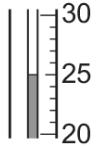
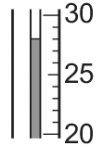
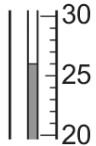
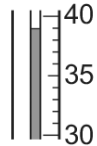
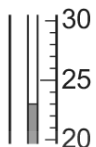
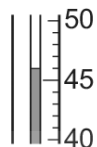
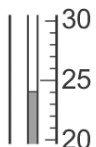
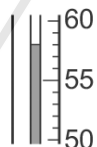
A student used the apparatus below to find the amount of heat produced when four different alcohols, methanol, ethanol, propanol and butanol, were burned.



- (a) Some methanol was put into the burner. The initial temperature of the water was measured. The burner was lit and allowed to burn for one minute. The flame was extinguished and the final temperature of the water was measured. The experiment was repeated with ethanol, propanol and butanol.

Use the thermometer diagrams to record the temperatures in the table on page 4. Complete the table by recording the temperature rise for each alcohol.

AceICGCSE
Paper Perfection, Crafted With Passion

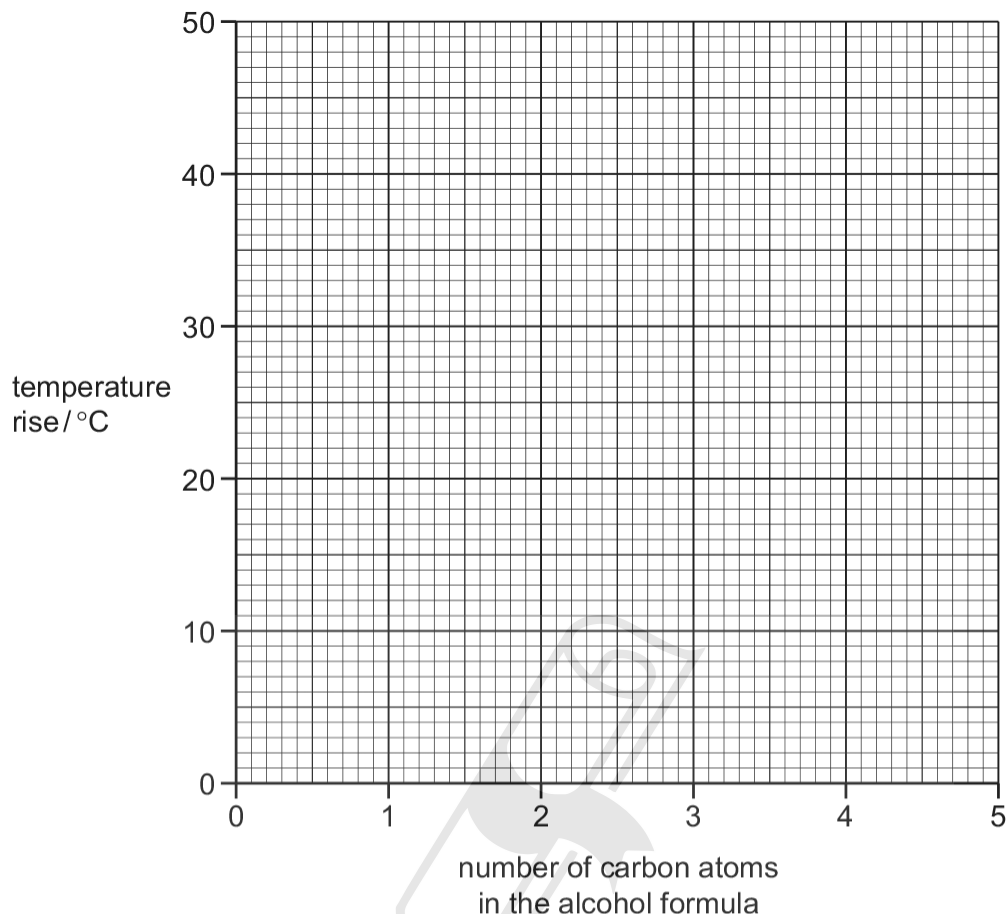
alcohol	formula	initial		final		temperature rise / °C
		thermometer diagram	temperature / °C	thermometer diagram	temperature / °C	
methanol	CH ₃ OH					
ethanol	C ₂ H ₅ OH					
propanol	C ₃ H ₇ OH					
butanol	C ₄ H ₉ OH					

[4]

AceIGCSE
Paper Perfection, Crafted With Passion

13.3. ALCOHOLS

(b) Plot the results obtained on the grid and draw a straight line graph.



[4]

(c) From your graph, work out the temperature rise expected if the experiment was repeated using pentanol, $C_5H_{11}OH$. Show clearly on the grid how you obtained your answer.

..... Paper Perfection, Crafted With Passion [3]

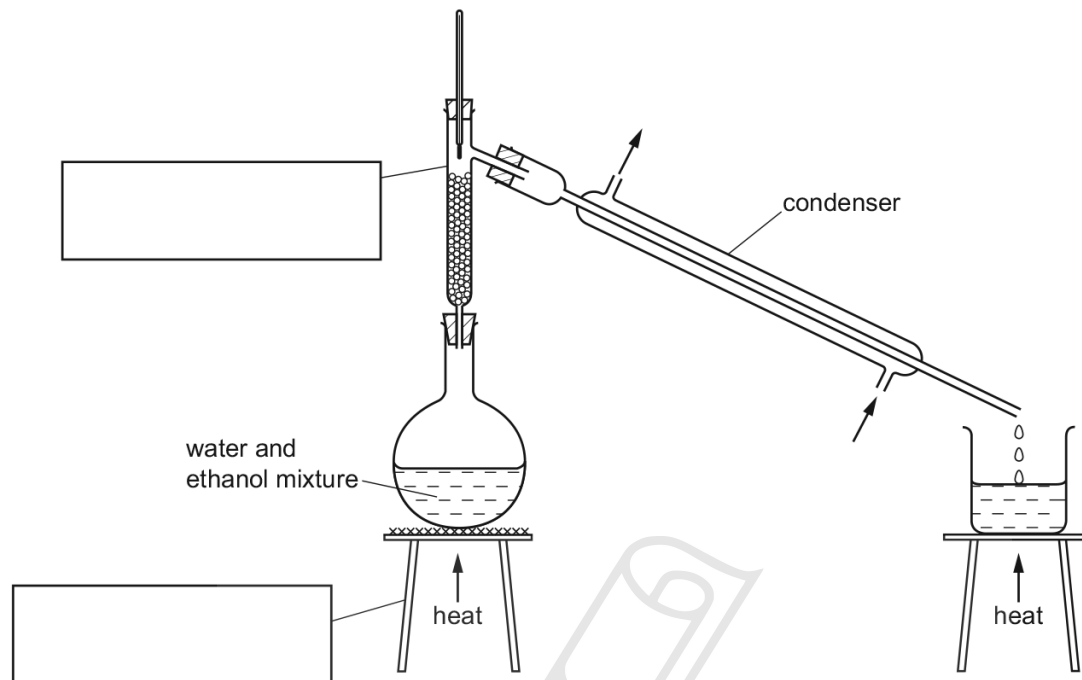
(d) Suggest the effect of using a copper can to contain the water instead of a boiling tube. Explain your answer.

.....
..... [2]

[Total: 13]

02. 0620_s16_qp_61 Q: 1

The diagram shows the apparatus used to separate a mixture of water, boiling point 100°C , and ethanol, boiling point 78°C .



(a) Complete the boxes to name the apparatus. [2]

(b) Label the arrows on the condenser. [1]

(c) Identify **one** mistake in the apparatus. [1]

.....

(d) Which liquid would collect first? Explain your answer. [2]

.....

.....

(e) Why would it be better to use an electrical heater instead of a Bunsen burner to heat the water and ethanol mixture? [1]

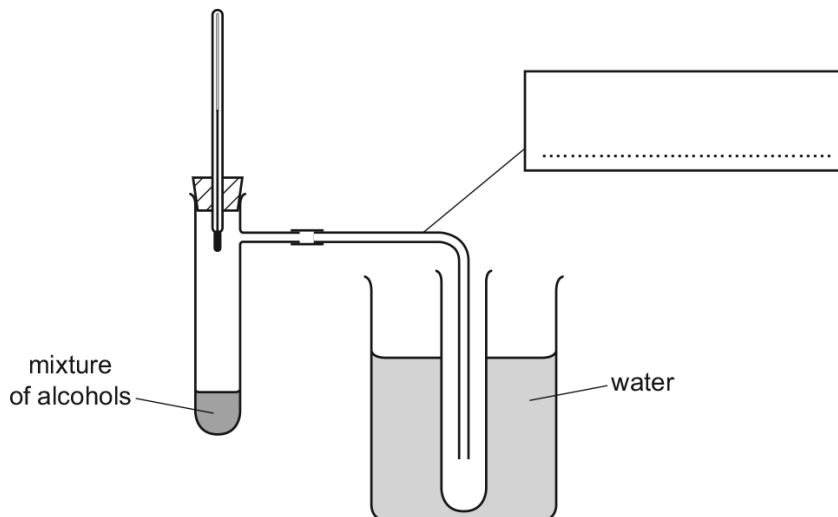
.....

[Total: 7]

13.3. ALCOHOLS

03.0620_s17_qp_63 Q: 1

A mixture of alcohols can be separated by fractional distillation. The apparatus shown was used to separate ethanol from the mixture.



(a) (i) Complete the box to identify the apparatus. [1]

(ii) Indicate with an arrow where heat is applied. [1]

(b) What is the purpose of the water?

.....
..... [2]

(c) Why is the thermometer bulb placed as shown and **not** in the mixture of alcohols?

.....
..... [1]

(d) Use the letter **E** to indicate on the diagram where ethanol would collect. [1]

(e) (i) Suggest a simple chemical test to show that the liquid collected is ethanol and **not** water.

..... [1]

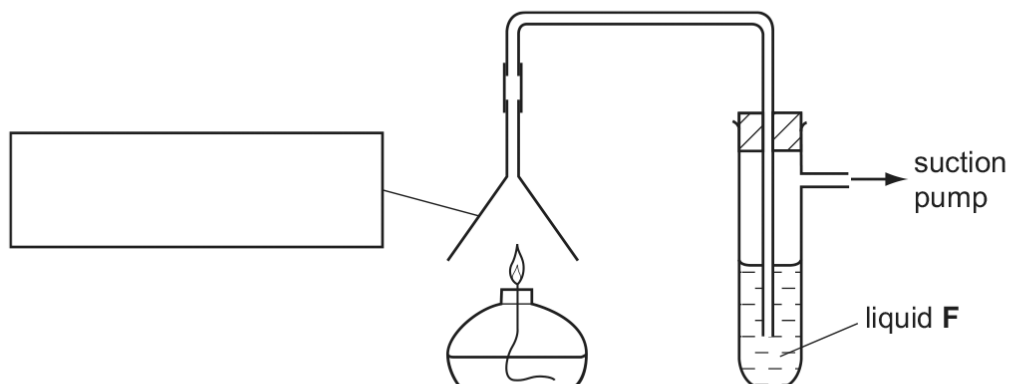
(ii) Give a physical test to identify pure ethanol.

..... [1]

[Total: 8]

04. 0620_w13_qp_61 Q: 1

A student investigated the products formed when ethanol was burned using the apparatus shown.



(a) Complete the box to identify the piece of apparatus. [1]

(b) Why is a suction pump used?

..... [1]

(c) (i) Suggest the purpose and identity of liquid F.

identity

purpose [2]

(ii) Why is the end of the delivery tube below the surface of liquid F?

.....

Paper Perfection, Crafted With Passion

..... [1]

(d) Give **one** expected observation in the horizontal part of the delivery tube. Explain your answer.

.....

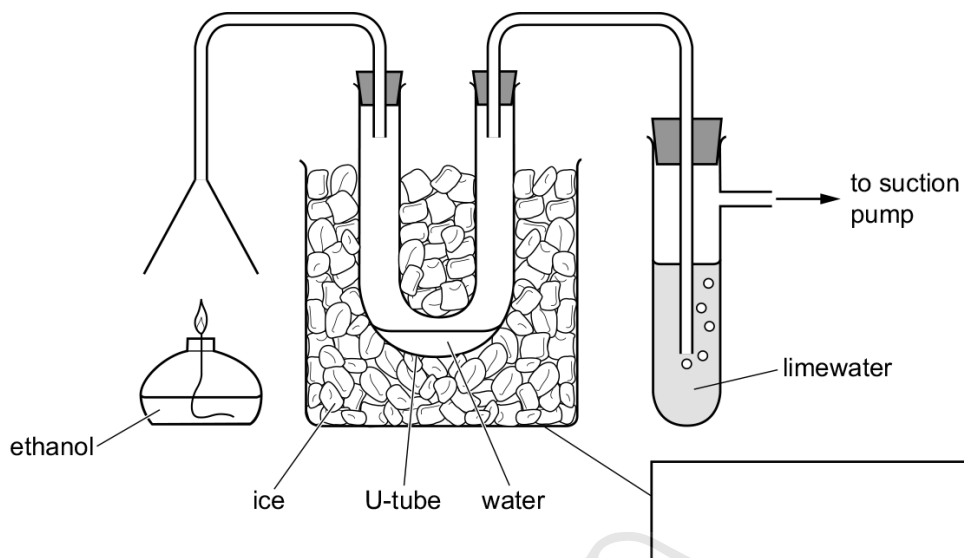
..... [2]

[Total: 7]

13.3. ALCOHOLS

05.0620_w19_qp_61 Q: 1

The apparatus shown was used to investigate the products formed when ethanol, C_2H_5OH , burns in air.



(a) Complete the box to name the apparatus. [1]

(b) Explain why water collects in the U-tube.

 [2]

(c) State a chemical test for water.
 test
 observations [2]

(d) What is the purpose of the suction pump?

 [1]

(e) Predict the change seen in the test-tube containing the limewater. Explain your prediction.

 [2]

[Total: 8]

01. 0620_s12_ms_61 Q: 2

- (a) thermometer readings correct (3), -1 for any incorrect
 methanol 25 28 3
 ethanol 26 39 13
 propanol 23 46 23
 butanol 24 58 34
 temperature rises correct (1) [4]
- (b) points plotted correctly $\pm 1/2$ small square (3)
 straight line drawn with a ruler (1) [4]
- (c) value from graph (1) unit (1) 44°C
 extrapolation shown on grid (1) [3]
- (d) temperature rises would be greater/faster/quicker (1)
 copper is a good conductor (1) [2]

[Total: 13]

02. 0620_s16_ms_61 Q: 1

(a)	fractionating column; tripod;	1 1	2
(b)	water labelled twice;		1
(c)	heat under (the collecting) beaker;		1
(d)	M1 ethanol; M2 lowest/lower boiling point;	1 1	2
(e)	ethanol is flammable;		1

03. 0620_s17_ms_63 Q: 1

(a)(i)	(delivery) tube		1
(a)(iii)	arrow beneath the tube containing the mixture of alcohols		1
(b)	to cool		1
	the gas into a liquid		1
(c)	to measure the temperature of the vapour/temperature of liquid would not be constant		1
(d)	E shown on the test-tube in water bath		1
(e)(i)	lighted splint ignites the liquid/test for water, e.g. add anhydrous copper(II) sulfate gives a negative result		1
(e)(ii)	melting/boiling point determination		1

04.0620_w13_ms_61 Q: 1

- (a) funnel (1) [1]
- (b) to move products through the apparatus / owtte e.g. let the gases go out (1) [1]
- (c) (i) limewater (1)
to detect carbon dioxide (1) [2]
- (ii) so gas bubbles through liquid (1) [1]
- (d) condensation / drops (1) water (1) [2]
allow: black deposit (1) soot / carbon (1)
-

05.0620_w19_ms_61 Q: 1

(a)	beaker	1
(b)	steam / (water) vapour	1
	condenses / cools	1
(c)	anhydrous copper(II) sulfate / cobalt(II) chloride (paper)	1
	turns blue / pink	1
(d)	to suck gases / products through apparatus	1
(e)	turns milky	1
	carbon dioxide formed	1

Ace | GCSE
Paper Perfection, Crafted With Passion