

# Alcohols & Carboxylic Acids

## Question Paper 2

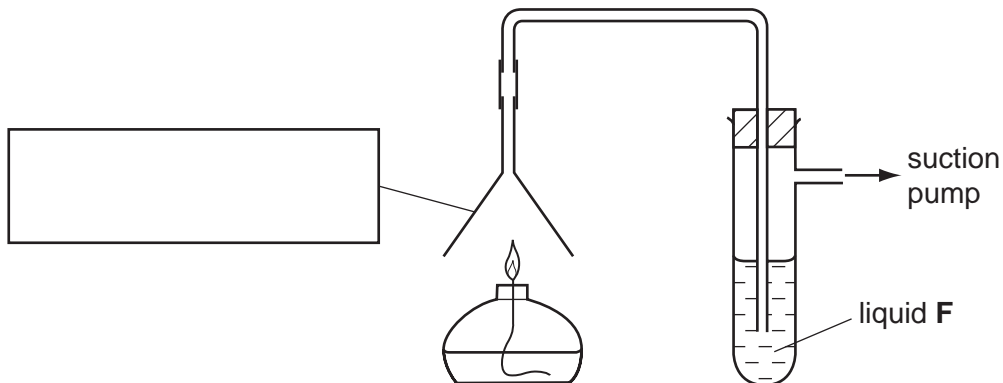
<b>Level</b>	IGCSE
<b>Subject</b>	Chemistry
<b>Exam Board</b>	CIE
<b>Topic</b>	Organic Chemistry
<b>Sub-Topic</b>	Alcohols & Carboxylic Acids
<b>Paper Type</b>	Alternative to Practical
<b>Booklet</b>	Question Paper 2

**Time Allowed:** 42 minutes

**Score:** /35

**Percentage:** /100

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]

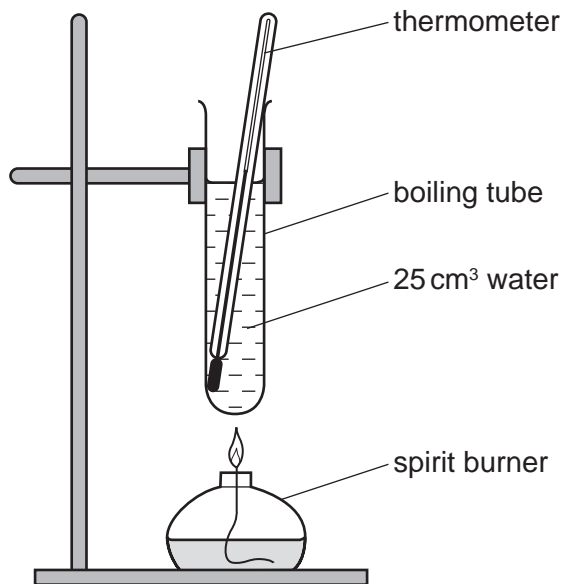
(ii) Why is the end of the delivery tube below the surface of liquid F?  
.....  
..... [1]

(d) Give **one** expected observation in the horizontal part of the delivery tube.  
Explain your answer.  
.....  
..... [2]

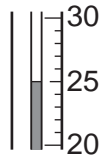
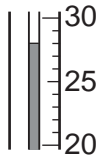
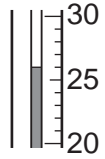
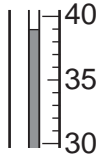
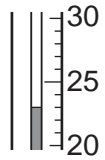
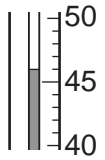
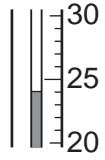
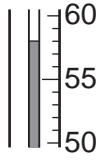
[Total: 7]

2 Heat is given out when alcohols are burned.

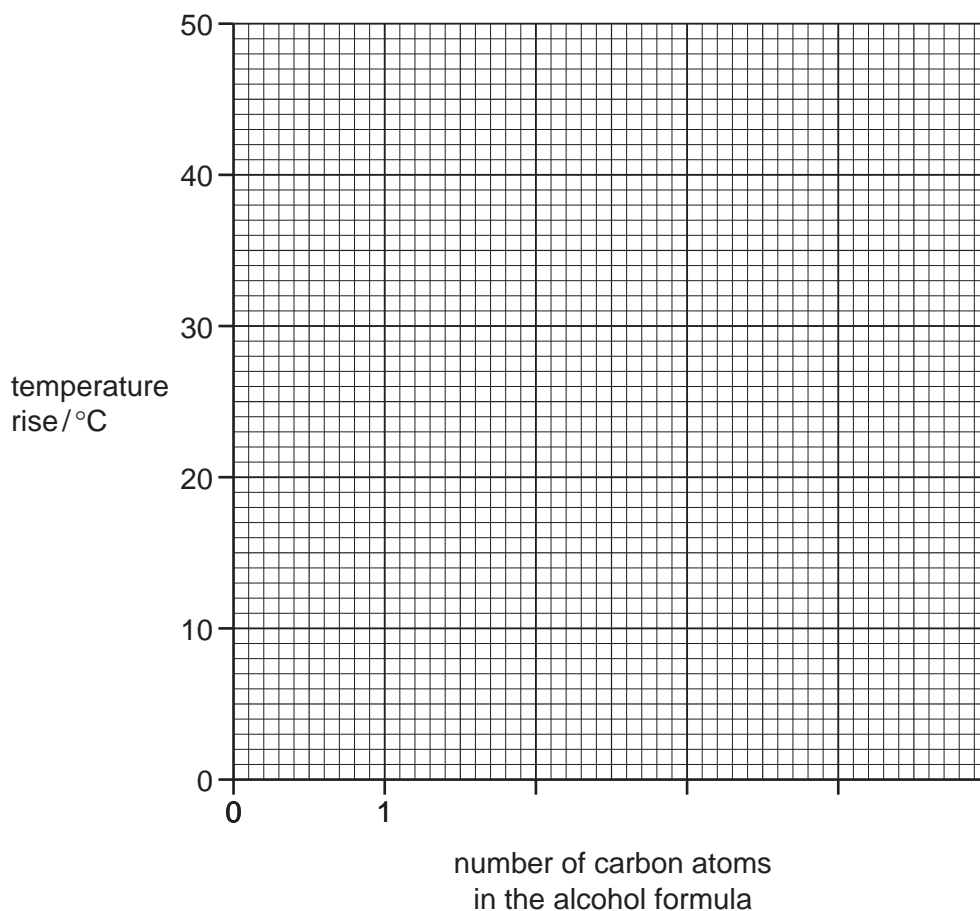
A student used the apparatus below to find the amount of heat produced when four different alcohols, methanol, ethanol, propanol and butanol, were burned.



- (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.

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

(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.

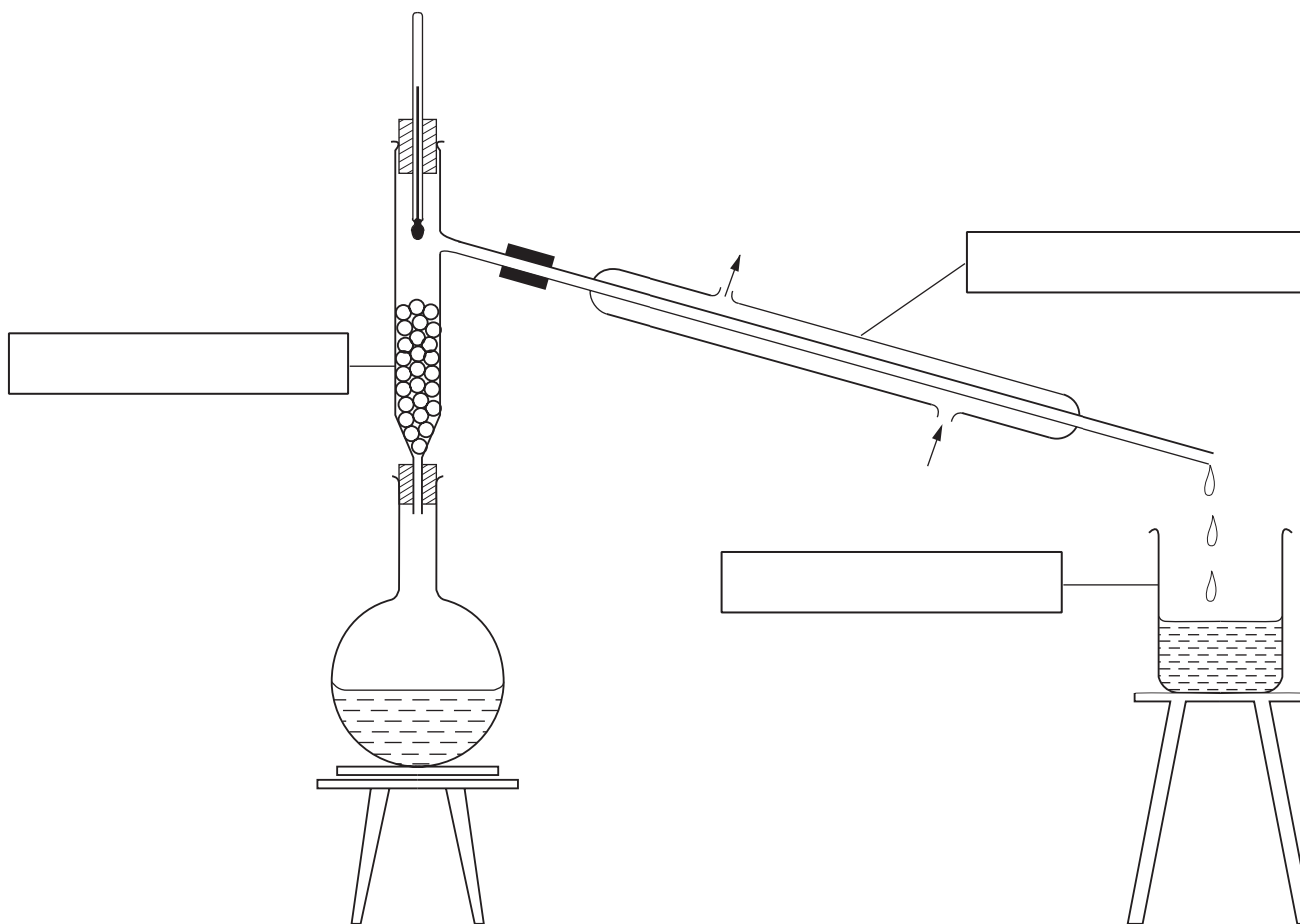
..... [3]

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

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

[Total: 13]

3 The apparatus below was used to separate ethanol from water.



(a) Complete the empty boxes to name the pieces of apparatus. [3]

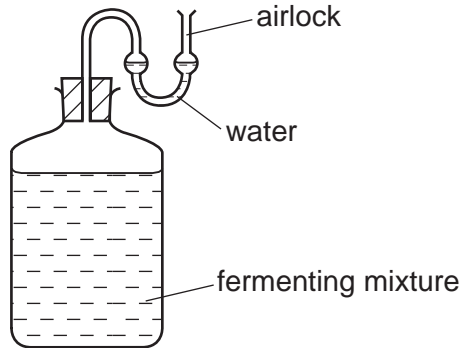
(b) Indicate by an arrow where heat is applied. [1]

(c) Name this separation process.  
.....[2]

4 A student found a recipe for making elderberry wine by fermentation.

- 1 kg elderberries
- 0.5 kg sugar
- 10 g yeast granules
- 3 dm<sup>3</sup> water

The student decided to make some elderberry wine using the apparatus below.



The student carried out the following method.

- Step 1 The elderberries were crushed.
- Step 2 The crushed elderberries and sugar were added to the water and the mixture was boiled for ten minutes. The crushed elderberries were then separated from the mixture.
- Step 3 Yeast was added to the liquid when it had cooled to room temperature.

(a) Suggest the purpose of the airlock in the apparatus.  
..... [1]

(b) What apparatus could be used in Step 1?  
..... [1]

(c) Draw a labelled diagram of the apparatus used to separate the crushed elderberries from the mixture in Step 2.

[2]

(d) Why was the yeast in Step 3 not added until the liquid was at room temperature?  
..... [1]

**(e) (i)** State **one** observation during the fermentation.

..... [1]

**(ii)** Suggest how the rate of the fermentation reaction could be measured.

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

**(f)** Name the method that could be used to separate ethanol from the fermented mixture.

..... [1]

[Total: 9]