Alcohols & Carboxylic Acids

Question Paper 1

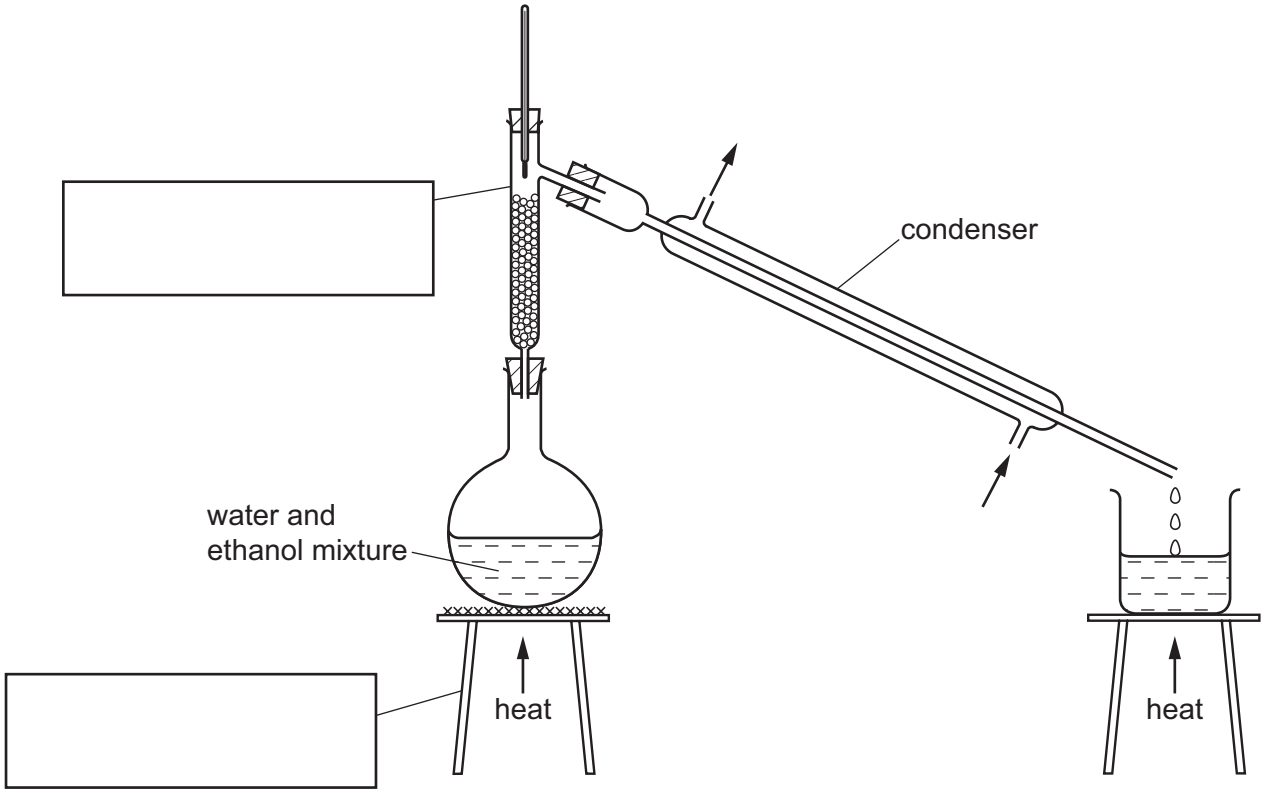
Level	IGCSE
Subject	Chemistry
Exam Board	CIE
Topic	Organic Chemistry
Sub-Topic	Alcohols & Carboxylic Acids
Paper Type	Alternative to Practical
Booklet	Question Paper 1

Time Allowed: **41 minutes**

Score: **/34**

Percentage: **/100**

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.

.....

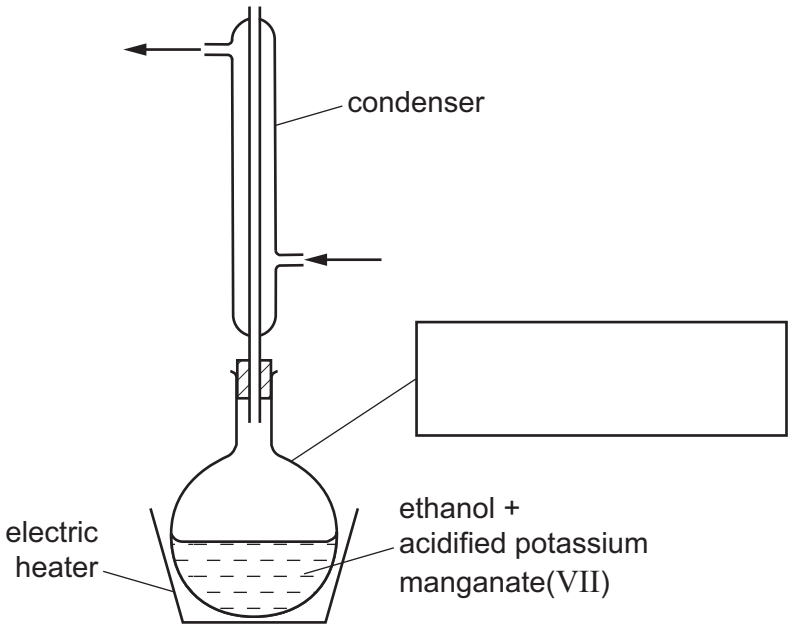
..... [2]

(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]

2 Ethanol was reacted with hot acidifiedpotassiummanganate(VII) solution using the apparatus below. Ethanoic acid was formed.



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

(ii) Label the arrows. [1]

(b) Suggest and explain why an electric heater is used to heat this reaction and not a Bunsen burner.

.....

..... [2]

(ii) Suggest why a condenser is necessary.

..... [1]

(c) Complete the table to show the difference in smell between ethanol and ethanoic acid.

	smell
ethanol	
ethanoic acid	

[2]

[Total: 7]

3 A student investigated the reaction between two different solids, **C** and **D**, and excess dilute hydrochloric acid.

Five experiments were carried out.

(a) *Experiment 1*

A measuring cylinder was used to pour 30 cm^3 of dilute hydrochloric acid into a polystyrene cup. The temperature of the dilute hydrochloric acid was measured. 1 g of solid **C** was added to the dilute hydrochloric acid and the mixture stirred with a thermometer.
The maximum temperature reached by the liquid mixture was measured.

(b) *Experiment 2*

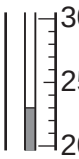
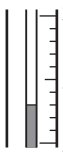
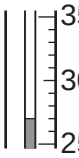
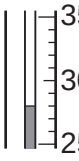
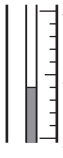
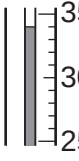
The polystyrene cup was emptied and rinsed with water.
Experiment 1 was repeated using 2 g of solid **C**.

(c) *Experiments 3 and 4*

Experiment 2 was repeated using 3 g and then 5 g of solid **C**.

Use the thermometer diagrams to record the results in the table below.

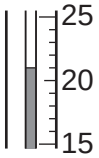
Complete the final column in the table.

experiment	mass of solid **C** / g	thermometer diagram	initial temperature of acid / °C	thermometer diagram	maximum temperature reached / °C	temperature difference / °C
1						
2						
3						
4						

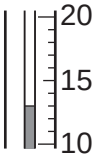
[3]

(d) *Experiment 5*

Experiment 1 was repeated using solid **D**. Use the thermometer diagrams to record the results in the spaces below.



initial temperature of acid



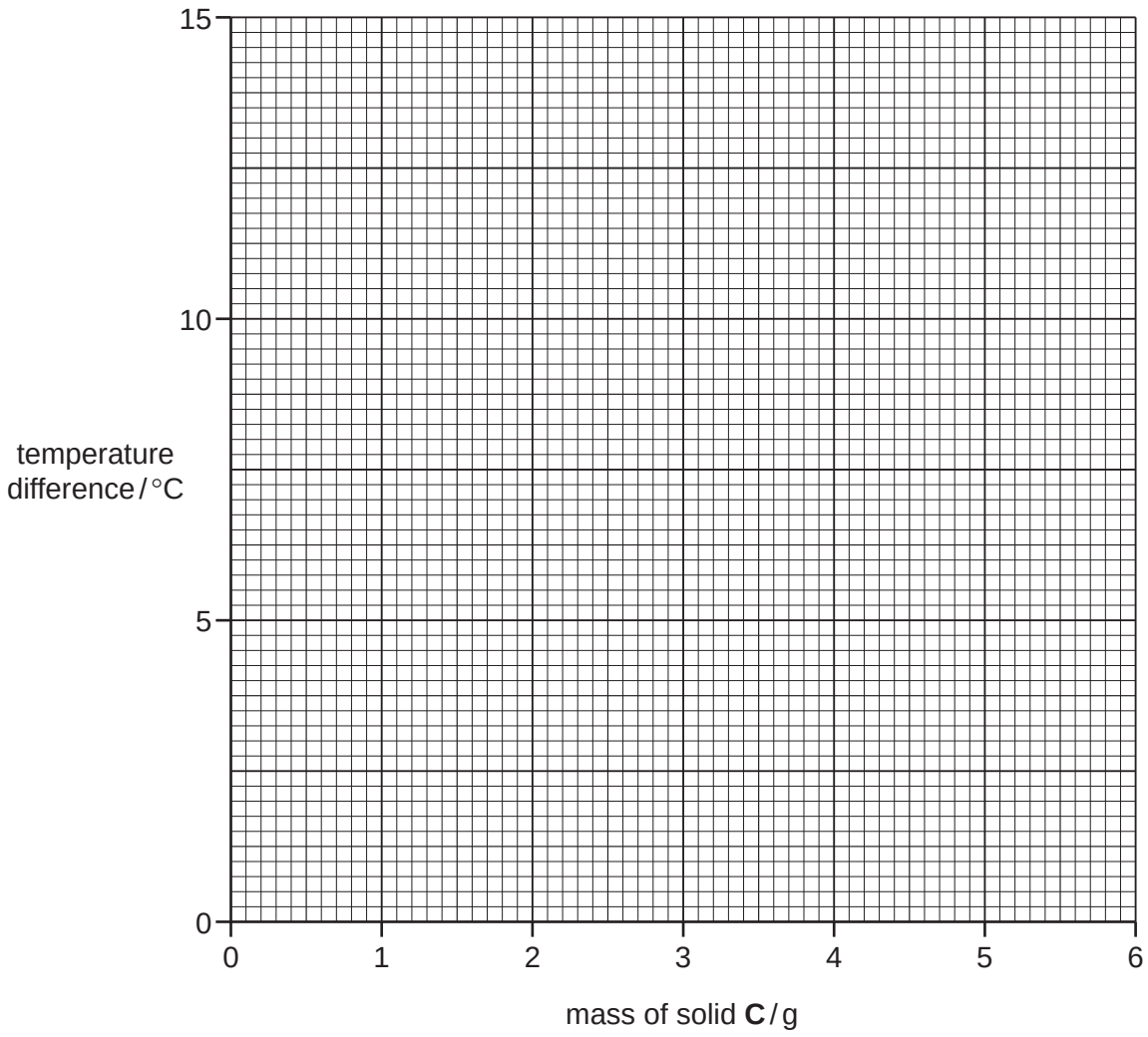
final temperature of liquid mixture

initial temperature of dilute hydrochloric acid = ... °C

final temperature of liquid mixture = ... °C

temperature change = ... °C [2]

(e) Plot the results for Experiments 1, 2, 3 and 4 on the grid and draw a straight line graph.



[4]

(f) **(i)** **From your graph**, deduce the temperature of the solution when 6 g of solid **C** is added to 30 cm^3 of dilute hydrochloric acid.
Show clearly **on the grid** how you worked out your answer.

..... °C [2]

(ii) **From your graph**, deduce the mass of solid **C** that would give a temperature rise of 9 °C when added to 30 cm^3 of dilute hydrochloric acid.

.....

..... [2]

(g) What type of chemical process occurs when solid **D** reacts with dilute hydrochloric acid?

..... [1]

(h) Suggest the effect on the results if Experiment 3 was repeated using 60 cm^3 of dilute hydrochloric acid.

.....

..... [2]

(i) Predict the temperature of the solution in Experiment 4 after 1 hour. Explain your answer.

.....

..... [2]

(j) When carrying out the experiments, what would be **one** advantage and **one** disadvantage of taking the temperature readings after exactly one minute?

advantage .....

.....

disadvantage .....

..... [2]

[Total: 20]