

Alcohols

AS & A Level

Question Paper 2

Level	A Level
Subject	Chemistry
Exam Board	OCR
Module	Core Organic Chemistry
Topic	Alcohols
Paper	AS & A Level
Booklet	Question Paper 2

Time allowed: 42 minutes

Score: /31

Percentage: /100

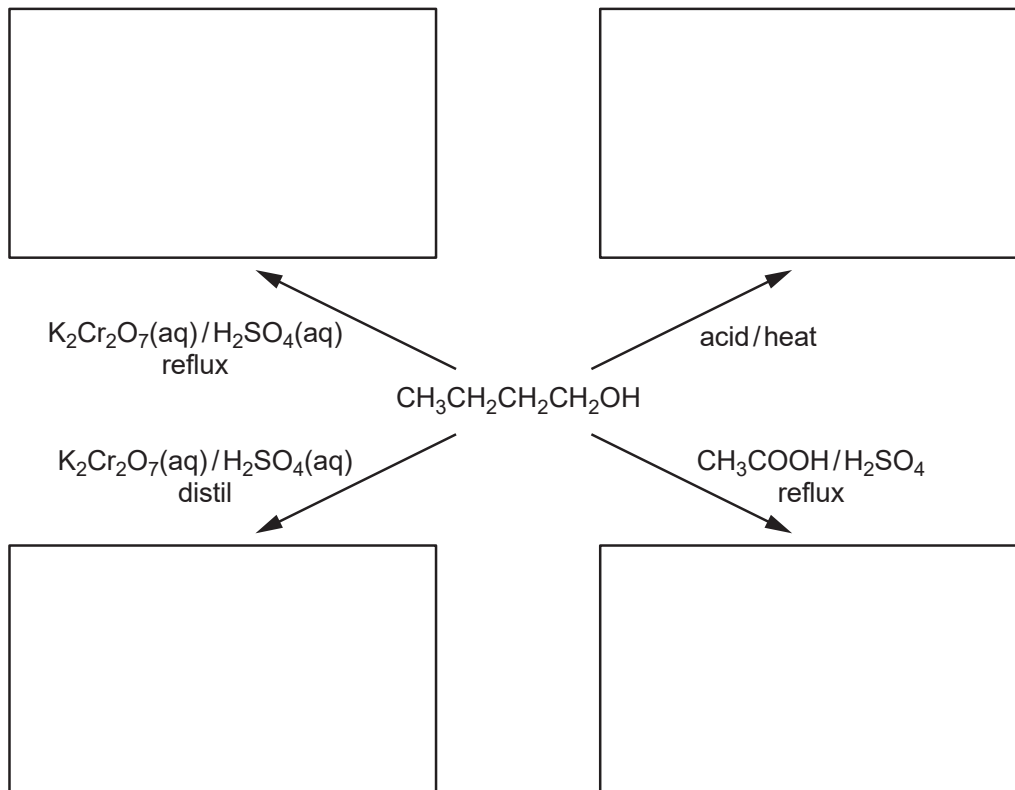
Grade Boundaries:

A*	A	B	C	D	E
>85%	73%	60%	47%	34%	21%

Question 1

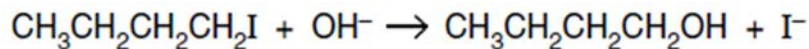
Alcohols are used in the industrial production of many organic compounds.

- (a) Complete the flowchart below to show the organic product formed in each of the reactions of butan-1-ol.



[4]

- (b) Butan-1-ol can be prepared by the alkaline hydrolysis of 1-iodobutane.



The reaction mixture is gently heated for 20 minutes.

- (i) The curly arrow model is used in reaction mechanisms to show the movement of electron pairs.

Use the curly arrow model to outline the mechanism for the alkaline hydrolysis of 1-iodobutane.

In your answer, include the name of the mechanism, the type of bond fission and relevant dipoles. [5]

- (ii) A student decides to prepare butan-1-ol by the alkaline hydrolysis of 1-chlorobutane.

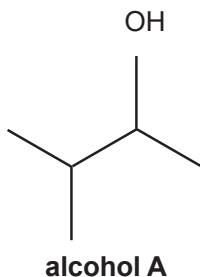
Suggest, with reasons, any change in the conditions from those used in the alkaline hydrolysis of 1-iodobutane. [2]

[Total 11 Marks]

Question 2

This question is about reactions of organic compounds containing carbon, hydrogen and oxygen.

(a) A chemist investigates two reactions of alcohol **A**, shown below.



(i) What is the systematic name of alcohol **A**? [1]

(ii) What is the structural formula of alcohol **A**? [1]

(iii) The chemist heats alcohol **A** with an acid catalyst to form a mixture containing **two** alkenes.

Draw the structures of the **two** alkenes formed in this reaction.

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[2]

(iv) The chemist heats alcohol **A** with sodium chloride and sulfuric acid.

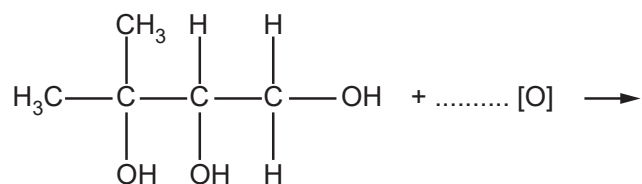
Construct a balanced equation for this reaction.

Show structures for the organic compounds in your equation.

[2]

(b) Compound **B**, shown below, is refluxed with excess acidified potassium dichromate(VI) to form a single organic product.

Complete the equation for this reaction.

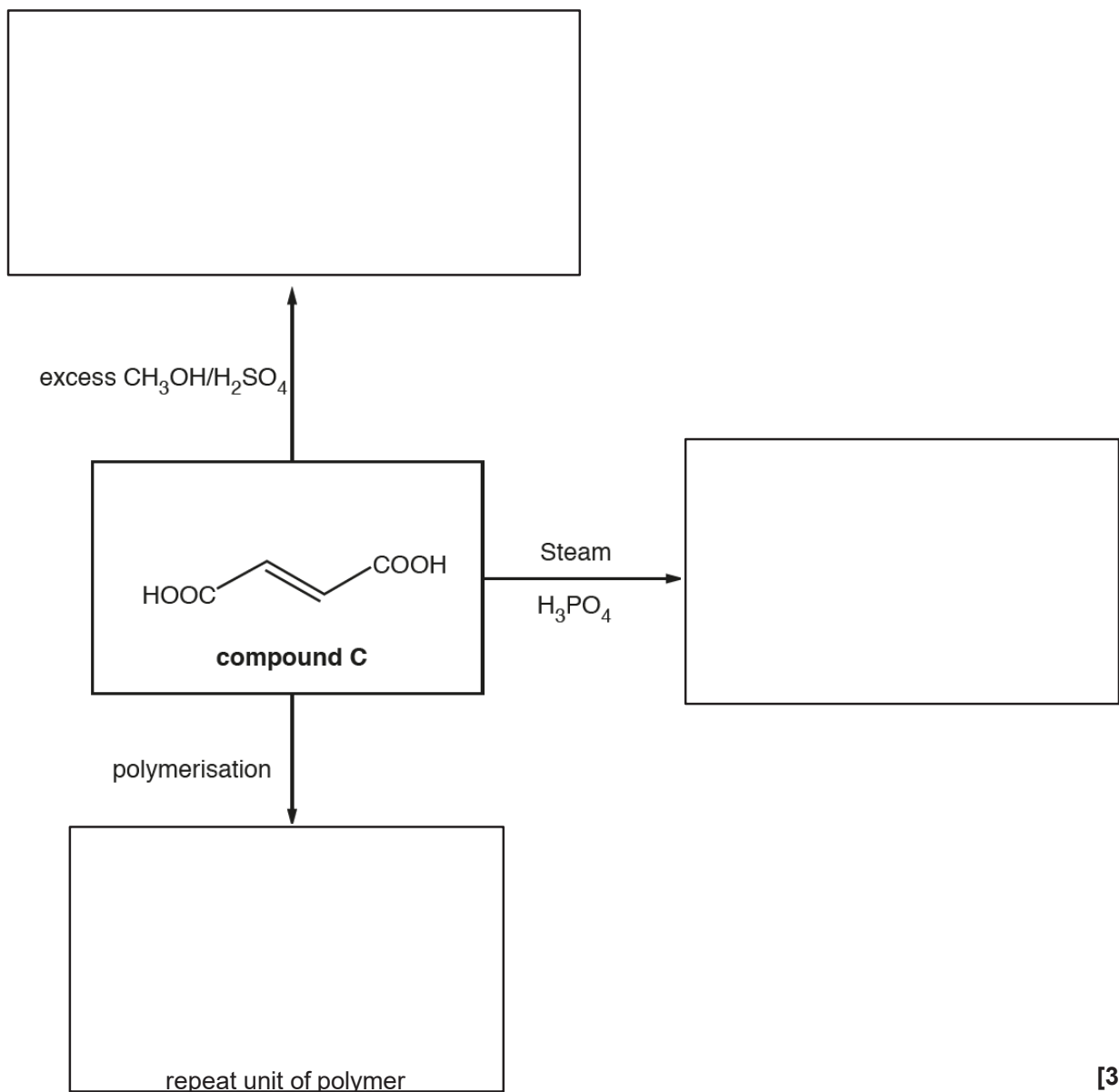


compound B

[2]

(c) The flowchart below shows some reactions of compound **C**.

In the boxes, draw the organic products of these reactions.



[3]

(Total 11 marks)

This question is about reactions involving alcohols.

(a) Three reactions of an alcohol **E** are shown in **Fig. 25.1**.

(i) Complete **Fig. 25.1** to show the structures of the organic products formed in the reactions.

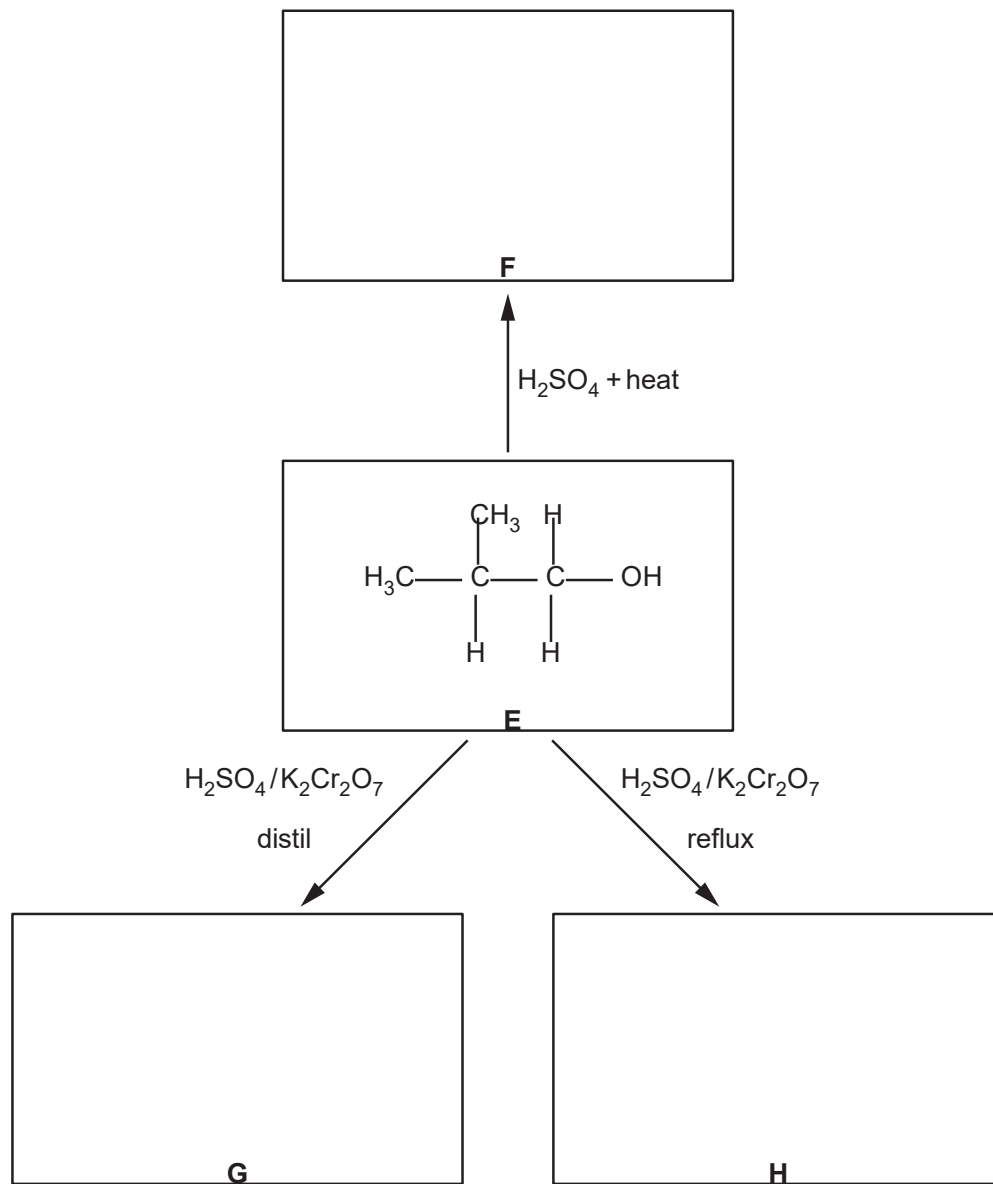


Fig. 25.1

[3]

(ii) What is the systematic name of alcohol **E**?

[1]

(b) An alcohol can be prepared by hydrolysing the haloalkane $C_2H_5CHBrCH_3$ with aqueous sodium hydroxide.

(i) Outline the mechanism for this reaction.

Show curly arrows and relevant dipoles.

[3]

(ii) The infrared (IR) spectrum for $C_2H_5CHBrCH_3$ is shown in **Fig. 25.2**. The C–Br bond absorption is labelled.

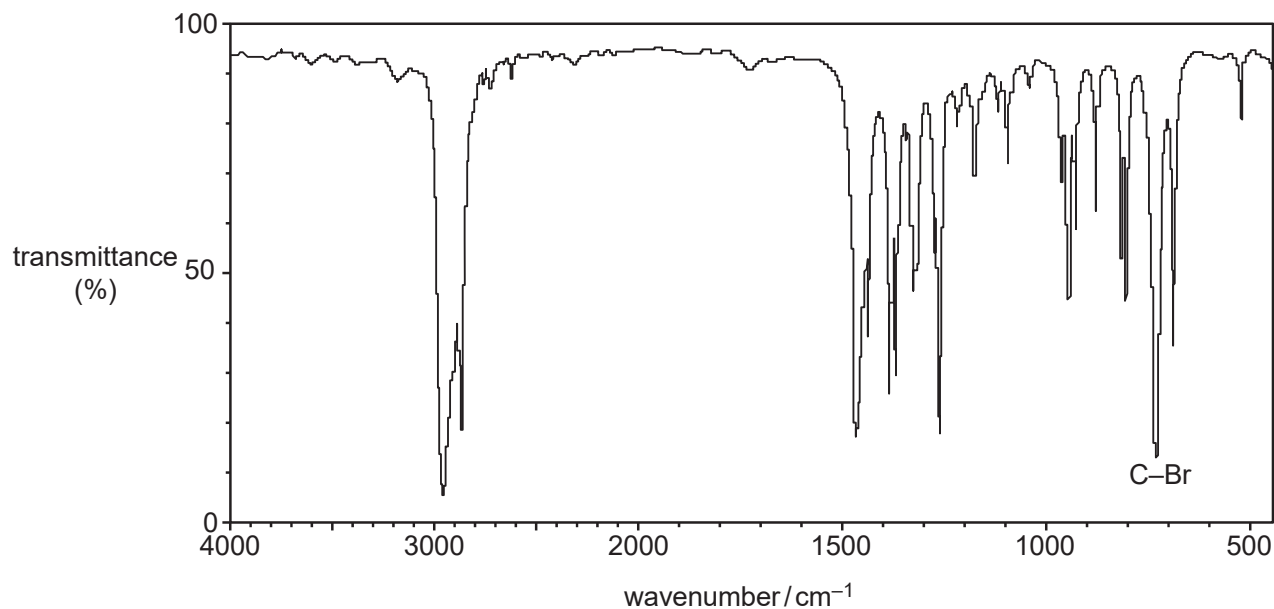


Fig. 25.2

Outline how IR spectroscopy could be used to show that the bromoalkane functional group has reacted and that the alcohol functional group has formed.

[2]

(Total 9 marks)