



Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2014

Centre Number

71

Candidate Number

Chemistry

Assessment Unit AS 3

assessing

Module 3: Practical Examination

Practical Booklet B

[AC134]

THURSDAY 8 MAY, MORNING



TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Answer **all five** questions.

Write your answers in the spaces provided.

INFORMATION FOR CANDIDATES

The total mark for this paper is 68.

Section A

Question 1 is a practical exercise worth 17 marks.

Question 2 is a practical exercise worth 15 marks.

Section B

Question 3 is a planning exercise worth 20 marks.

Questions 4 and 5 are written questions worth a total of 16 marks, testing aspects of experimental chemistry.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

A Periodic Table of Elements (including some data) is provided.

You may not have access to notes, textbooks and other material to assist you.

For Examiner's use only

Question Number	Examiner Mark	Remark
1		
2		
3		
4		
5		

Total Marks

Section A

Examiner Mark	Remark

1 Titration exercise

A back titration was used to calculate the mass of calcium carbonate in an indigestion tablet.

Solution **A** was made by reacting **two** indigestion tablets, total mass 2.64 g, with 25.0 cm³ of 2.0 mol dm⁻³ hydrochloric acid and then making this up to 250 cm³.

25.0 cm³ of this solution was then titrated against 0.10 mol dm⁻³ sodium hydroxide solution and the titre was found to be 23.8 cm³.

- (a) The indicator used was phenolphthalein. State the colour change at the end point of the titration.

_____ to _____ [2]

- (b) (i) Write an equation for the reaction of calcium carbonate with hydrochloric acid.

_____ [2]

- (ii) Write an equation for the reaction of hydrochloric acid with sodium hydroxide.

_____ [1]

2 Observations and deductions.

(a) A mixture of two white salts, labelled **Y**, have a common cation.

The following tests were carried out on **Y** and the observations noted in the table. Complete the table by recording the deductions which can be made from these observations and identify the two salts.

Test	Observations	Deductions
1 Place a spatula measure of Y in a test tube and heat strongly. Test any gas given off with lime water.	<i>Colourless liquid on sides of test tube</i> <i>Limewater turns milky</i>	[2]
2 Make a solution of Y by dissolving a half spatula measure of Y in a test tube one third full of dilute hydrochloric acid. Add 1 cm ³ of barium chloride solution to the test tube.	<i>Effervescence</i> <i>No change</i>	[1] [1]
3 Make a solution of Y by dissolving a half spatula measure of Y in a test tube one third full of deionised water. Add 1 cm ³ of magnesium sulfate solution to the test tube.	<i>No change</i>	[1]
4 Make a solution of Y by dissolving a quarter spatula measure of Y in a test tube one third full of dilute nitric acid. Add 1 cm ³ of silver nitrate solution and then, in a fume cupboard, 5 cm ³ of dilute ammonia solution.	<i>White precipitate, precipitate dissolves</i>	[1]
5 Dip a nichrome wire loop in concentrated hydrochloric acid; touch Y with the wire and then hold it in a blue Bunsen flame.	<i>Lilac flame</i>	[1]

Name the **two** salts present in **Y**:

_____ and _____ [2]

Examiner Mark	Remark

- (b) The following observations were recorded for tests carried out on an organic liquid, labelled **Z**. Complete the deductions.

Test	Observations	Deductions
1 Place 1 cm ³ of Z in a test tube and add 1 cm ³ of water, add a bung and shake the test tube.	<i>Two layers formed</i>	[1]
2 Place 10 drops of Z on a watch glass placed on a heatproof mat and ignite it using a burning splint.	<i>Yellow, smoky flame</i>	[1]
3 In a fume cupboard add approximately 0.5 cm ³ of Z to a test tube one quarter full of bromine water and mix well.	<i>Orange bromine water decolourised</i>	[1]
4 Place 1 cm ³ of Z in a test tube and add 1 cm ³ of ethanol and 1 cm ³ of silver nitrate. Place the test tube in a beaker of water heated to just below boiling point. Leave for 5 minutes.	<i>Yellow precipitate</i>	[1]

Based on the experiments above, suggest:

two functional groups which may be present in **Z**.

1. _____

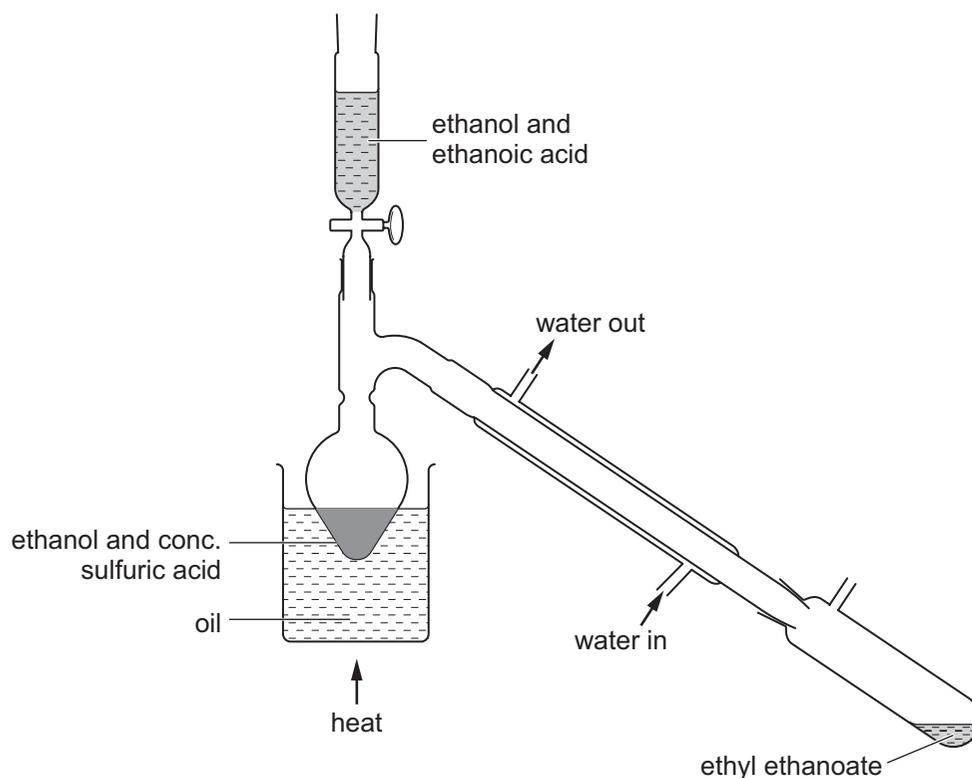
2. _____ [2]

Examiner Mark	Remark

Section B

3 Planning

Ethyl ethanoate can be prepared by reacting ethanol with glacial (pure) ethanoic acid.



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Place 5.0 cm^3 of ethanol in the flask, immersing the latter in oil. Add slowly and with gentle stirring 5.0 cm^3 of concentrated sulfuric acid. Set up the apparatus as shown in the diagram.

Place a mixture of 5.0 cm^3 ethanol and 12 cm^3 of ethanoic acid in the dropping funnel. Raise the temperature of the oil bath to 140°C , then run the mixture dropwise into the flask. Add the mixture at the same rate as the ethyl ethanoate distils over.

Transfer the distillate to a separating funnel. Add 10 cm^3 of sodium carbonate solution and shake, removing the stopper from time to time. Discard the lower aqueous layer.

Run the upper layer into a beaker and add a suitable drying agent. Redistil the liquid collecting the fraction which boils between $75\text{--}79^\circ\text{C}$.

(a) Write an equation for the reaction of ethanol with ethanoic acid.

_____ [1]

Examiner Mark	Remark

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