



Cambridge Assessment International Education

Cambridge International General Certificate of Secondary Education

CANDIDATE NAME			
CENTRE NUMBER		CANDIDATE NUMBER	
CHEMISTRY			0620/61
Paper 6 Alternative to Practical			May/June 2019
			1 hour
Candidates ans	wer on the Question Paper.		
No Additional Ma	aterials are required.		

READ THESE INSTRUCTIONS FIRST

Write your centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer all questions.

Electronic calculators may be used.

You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.

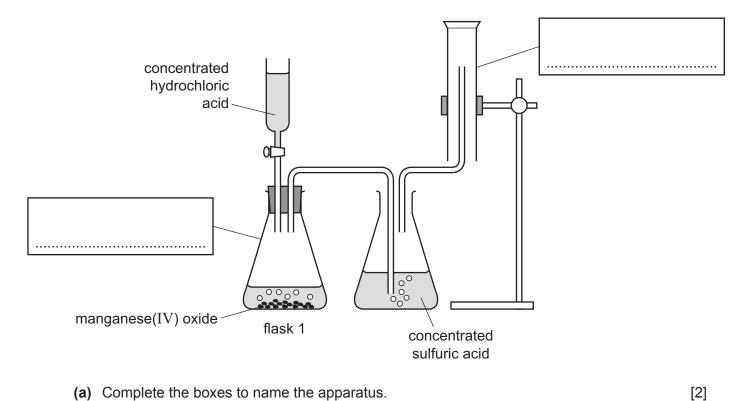
The number of marks is given in brackets [] at the end of each question or part question.

This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate. This document consists of 8 printed pages and 4 blank pages.



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1 The diagram shows the apparatus a student used to prepare a dry sample of chlorine gas. Chlorine is more dense than air.



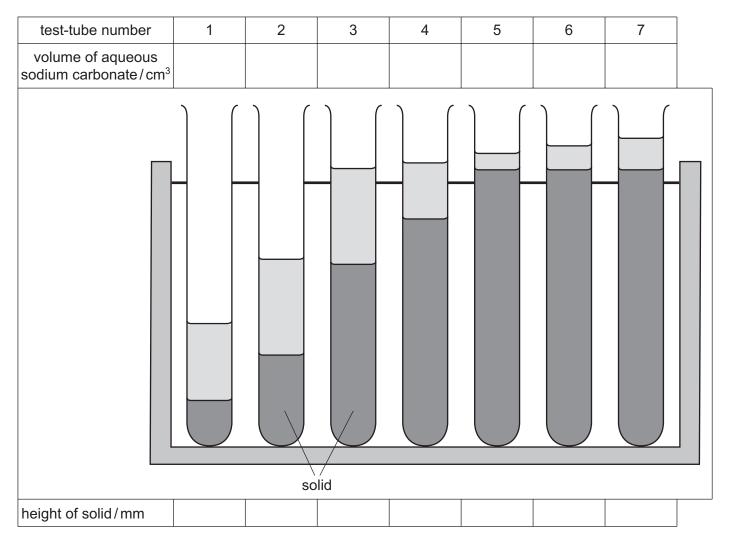
(b)	Use the diagram to identify two mistakes the student made.	
	1	
	2	
		[2]
(c)	Suggest one reason why the gas produced in flask 1 is passed through concentrate sulfuric acid.	ed
	[[1]
(d)	Describe a test for chlorine.	
	test	
	observations	 [2]
	L	, -
(e)	Suggest why this experiment is done in a fume cupboard.	
	[[1]

[Total: 8]

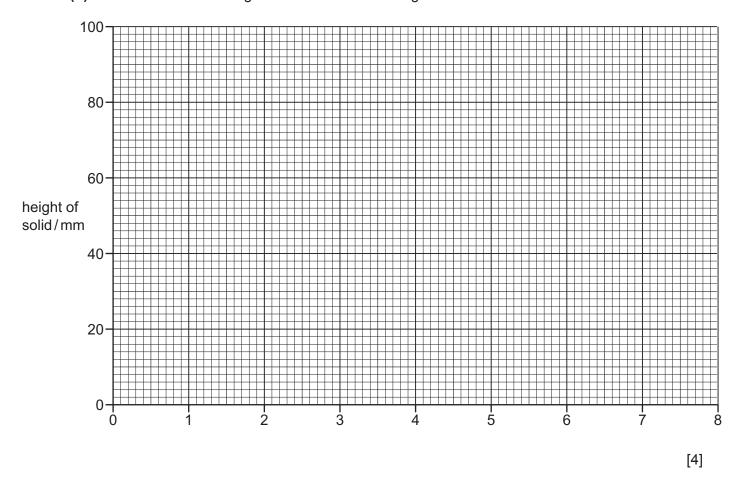
- 2 A student investigated the reaction between aqueous sodium carbonate and aqueous barium nitrate.
 - A burette was filled with aqueous sodium carbonate.
 - Seven test-tubes were labelled 1, 2, 3, 4, 5, 6 and 7.
 - A measuring cylinder was used to pour 6 cm³ of aqueous barium nitrate into each of the seven test-tubes in a test-tube rack.
 - 1.0 cm³ of aqueous sodium carbonate was added from the burette to test-tube 1.
 - 2.0 cm³ of aqueous sodium carbonate was added from the burette to test-tube 2.
 - 4.0 cm³ of aqueous sodium carbonate was added from the burette to test-tube 3.
 - 5.0 cm³ of aqueous sodium carbonate was added from the burette to test-tube 4.
 - 6.0 cm³ of aqueous sodium carbonate was added from the burette to test-tube 5.
 - 7.0 cm³ of aqueous sodium carbonate was added from the burette to test-tube 6.
 - 8.0 cm³ of aqueous sodium carbonate was added from the burette to test-tube 7.

A glass rod was used to stir the contents of each of the test-tubes. The contents of the test-tubes were left to stand until the solid formed had settled. A ruler was used to measure the height of the solid formed in each test-tube.

(a) Use a ruler to measure the heights of the solid formed in each test-tube shown in the diagram. Record the heights of the solid formed in the table and complete the table.



(b) Plot the results on the grid. Draw **two** intersecting lines of best fit. Label the *x*-axis.



(c) From your graph, deduce the height of the solid formed when 3.0 cm³ of aqueous sodium carbonate is added to 6 cm³ of aqueous barium nitrate.

Show clearly on the grid how you worked out your answer.

mr	n [2	2

(d) Describe the trend in the heights of the solids formed in test-tubes 1–7.

(e)	Predict what would happen if the experiment were continued using three further test-tubes each containing 6 cm³ of aqueous barium nitrate and separately adding 9.0 cm³, 10.0 cm³ and 11.0 cm³ of aqueous sodium carbonate to each one. Explain your answer.
	[2]
(f)	Suggest one change to the apparatus used which could be made to obtain more accurate results.
	[1]
(g)	Suggest a different method to measure the amount of solid formed during the experiment.
	[3]
(h)	Suggest how the reliability of the results could be checked.
	[1]
	[Total: 18]

3		o substances, solution ${f F}$ and solid ${f G}$, were analysed. Solution ${f F}$ was dilute hydrochloric acid ts were done on solution ${f F}$ and solid ${f G}$.	1.
	test	ts on solution F	
	Cor	mplete the expected observations.	
	Soli	ution F was divided into four equal portions in four test-tubes.	
	(a)	The pH of the first portion of solution F was tested.	
		pH =	[1]
	(b)	Magnesium ribbon was added to the second portion of solution ${\bf F}$. The gas produced v tested.	vas
		observations	
			[3]
	(c)	Dilute nitric acid and aqueous silver nitrate were added to the third portion of solution F .	
		observations	[1]

(d) Dilute nitric acid and aqueous barium nitrate were added to the fourth portion of solution F.

tests on solid G

Some of the tests and observations are shown.

tests on solid G	observations
The appearance of solid G was studied.	white solid
test 1 Dilute hydrochloric acid was added to solid G . The gas produced was tested. The solution formed was divided into two portions for test 2.	rapid effervescence limewater turned milky
test 2 An excess of aqueous sodium hydroxide was added to the first portion of the solution from test 1. An excess of aqueous ammonia was added to the second portion of the solution from test 1.	white precipitate formed which was insoluble in excess no precipitate formed

(e)	Identify solid G .
	[2]
	[Total: 8]

- 4 Steel nails rust in the presence of air and water. Plan an investigation to:
 - show that coating steel nails with paint helps to protect the nails from rusting
 - show that coating steel nails with zinc helps to protect the nails from rusting
 - determine which coating is more effective at protecting steel nails from rusting.

You are provided with:

_	uncoated	04001	noile
•	uncoaleo	SIEEL	Halls

- steel nails coated with paint
- steel nails coated with zinc
- common laboratory apparatus.

 	 	 	 	 	[6]

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