



Cambridge International Examinations

Cambridge International General Certificate of Secondary Education

Paper 6 Alterna	tive to Practical		May/June 2016
CHEMISTRY			0620/62
CENTRE NUMBER		CANDIDATE NUMBER	
CANDIDATE NAME			

Candidates answer on the Question Paper.

No Additional Materials 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.

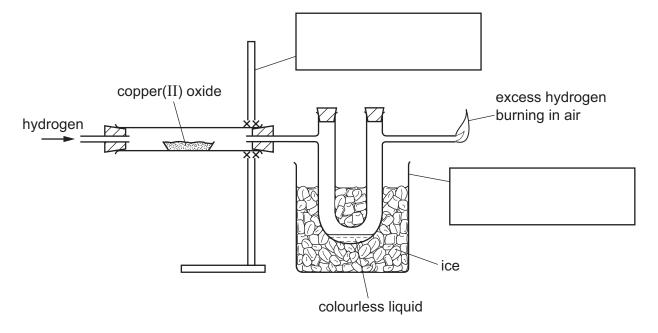
The number of marks is given in brackets [] at the end of each question or part question.

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



[Total: 10]

1 The diagram shows the apparatus used to reduce copper(II) oxide with hydrogen.



(a)	Cor	mplete the boxes to name the apparatus.	[2]
(b)	Use	e an arrow to indicate where heat is applied.	[1]
(c)	The	e colour of the copper(II) oxide changes from to	[2]
(d)	Sug	ggest a reason why the U-tube is surrounded by ice.	
			[1]
(e)	(i)	Identify the colourless liquid formed.	
			[1]
	(ii)	Give a chemical test for this liquid.	
		test	
		result	
			[2]
	(iii)	How could you show that this liquid is pure?	
			[1]

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- 2 A student investigated the rate of reaction between hydrogen peroxide and aqueous potassium iodide. When these chemicals react they form iodine. Sodium thiosulfate solution reacts with iodine and can be used to show how fast the reaction proceeds.
 - (a) A burette was filled up to the 0.0 cm³ mark with sodium thiosulfate solution.
 - Using a large measuring cylinder, 100 cm³ of distilled water were poured into a conical flask. Using a small measuring cylinder, 6 cm³ of sulfuric acid, 1 cm³ of starch solution and 4 cm³ of aqueous potassium iodide were added to the flask.
 - 0.5 cm³ of sodium thiosulfate solution was added from the burette to the mixture in the flask and swirled to mix.

The reaction was then started by adding 3 cm³ of hydrogen peroxide solution to the mixture, and the timer started.

The time taken for a blue colour to appear was noted.

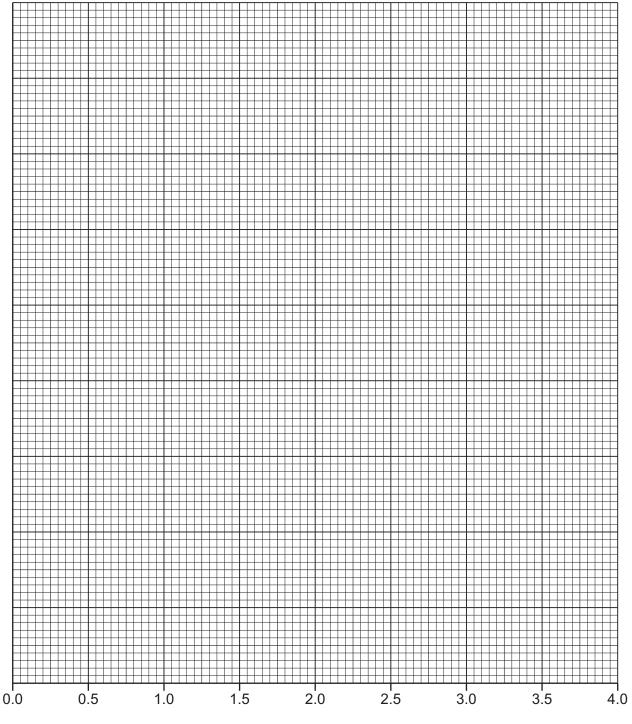
A further $0.5\,\mathrm{cm^3}$ of sodium thiosulfate solution was added to the mixture in the conical flask, swirled and the blue colour disappeared. The time when the blue colour reappeared was noted. The experiment continued by adding further $0.5\,\mathrm{cm^3}$ portions of sodium thiosulfate solution until a total of $3.0\,\mathrm{cm^3}$ of sodium thiosulfate solution had been added, noting the times at which the blue colour reappeared.

Use the timer diagrams on page 4 to record the times in seconds in the table.

total volume of sodium thiosulfate solution added/cm ³	timer diagram	time at which blue colour appeared/s
0.5	0 seconds 0 5 15 15 minutes	
1.0	45 15 15 15	
1.5	45 15 15 15	
2.0	45 15 15	
2.5	45 45 15 15	
3.0	45 15 15	

[3]

(b) Plot the results you have obtained on the grid and draw a best-fit straight-line graph.



time/s

volume of sodium thiosulfate solution/cm3

[5]

(c) (i) From your graph deduce the time at which the blue colour would appear if a total of 4.0 cm³ of sodium thiosulfate solution were added to the mixture in the conical flask. Show clearly **on the grid** how you worked out your answer.

Sketch on the grid the graph you would expect if the experiment was repeated at a higher temperature. [1]

(d)	Sug	ggest the purpose of the starch solution.
		[1]
(e)	(i)	Suggest one advantage of using a pipette to measure the volume of the hydrogen peroxide.
		[1]
	(ii)	Suggest and explain one disadvantage of using a pipette to measure the volume of the hydrogen peroxide.
		[2]
(f)	Exp	plain one disadvantage of using a beaker instead of a conical flask.
	••••	
		[1]
		[Total: 17]

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3	Two solids, E and F, were analysed. Solid E was sodium sulfite. Both solids were found to be water
	soluble.

The tests on the solids, and some of the observations, are shown below.

4 4				
tests	α n	COL	10	-
ıcsıs	UII	301	ıu	_

(a)	Des	scribe the appearance of the solid.	r	41
			[1]
(b)	Dis	tilled water was added to solid E in a tes	st-tube and shaken to dissolve.	
	The	e solution was divided into two portions in	n two test-tubes and the following tests carried or	ıt.
	(i)	Aqueous sodium hydroxide was added	to the first portion of the solution.	
		observations	[1]
	(ii)		the second portion of the solution. The mixturested with a piece of filter paper soaked in aqueoublution.	
		observations		
			[2]
(c)	Δfl	ame test was carried out on solid E .		
(0)			[11
	ODS	scrvations	[ני
tes	ts o	n solid F		
		tests	observations	
		d was heated. The gas given off was th damp, red litmus paper.	pungent gas evolved	
icsic	a wi	ur damp, red liunds paper.	red litmus paper turned blue	
		sodium hydroxide was added to	pungent gas evolved	
		nd the mixture heated. The gas given ested.	Universal Indicator paper showed pH 10	
(d)	lde	ntify the gas given off in the tests on soli		11
			[ין
(e)	lde	ntify one of the ions in solid F .		
			[1]
			[Total:	7]

Potassium sulfate is the salt produced when sulfuric acid is neutralised by potassium hydroxide solution.
The correct amount of potassium hydroxide solution must be added to neutralise all of the sulfuric acid.
Plan an experiment to obtain pure crystals of potassium sulfate from sulfuric acid and potassium hydroxide solution.
You are provided with common laboratory apparatus.
[6
[Total: 6

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