

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS International General Certificate of Secondary Education

NAME			
CENTRE NUMBER		CANDIDATE NUMBER	
CHEMISTRY			0620/06
Paper 6 Altern	ative to Practical	Octo	ber/November 2009
			1 hour
Candidates ar	swer on the Question Paper.		

READ THESE INSTRUCTIONS FIRST

No additional materials are required.

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 a pencil for any diagrams, graphs or rough working.

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

DO NOT WRITE IN ANY BARCODES.

Answer all questions.

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.

For Examiner's Use										
1										
2										
3										
4										
5										
6										
7										
Total										

This document consists of 12 printed pages.



The apparatus below was used to make oxygen. The tube of manganese oxide was a to the hydrogen peroxide solution by releasing the cotton. 1

www.PapaCambridge.com 100 cm³ cotton hydrogen peroxide tube containing manganese oxide

(a)	Complete the boxes to identify the pieces of apparatus.	[2]
(b)	Why was the tube of manganese oxide suspended in the flask?	
		[1]
(c)	Give a test for oxygen.	
	test	
	result	[2]

[Total: 5]

www.PapaCambridge.com A steel spoon can be coated in silver using electrolysis. The spoon must be very clearer of grease. 2

metal electrode spoon electrolyte

(a)	Su	ggest	
	(i)	one advantage of putting a thin layer of silver on the spoon,	
			[1]
	(ii)	one disadvantage if the spoon is used frequently,	
			[1]
	(iii)	why the spoon must be very clean and free of grease?	
			[1]
(b)	Wh	ich electrode should be the spoon?	
			[1]
(c)	lde	ntify the metal from which the other electrode is made.	
			[1]
		[Tota	l: 5]

Jids: For iner's

[Total: 6]

- 3 Three unlabelled bottles of chemicals each contained one of the following liquids:
 - sodium nitrate dissolved in water;
 - pure water;
 - hexene.

(a)	(a) Give a test by which you could identify sodium nitrate sol	ution.	
	test		
	result	[2	2]
(b)			
	result	[2	2]
(c)	(c) Give a test by which you could identify hexene. test		
	result		 2]

www.PapaCambridge.com A student investigated the temperature change produced when equal leng magnesium ribbon reacted with excess dilute sulfuric acid of different concentral. (labelled solutions A, B, C, D and E).

Five experiments were carried out.

Experiment 1

Using a measuring cylinder, 20 cm³ of sulfuric acid solution **A** was poured into a beaker. The initial temperature of the solution was measured. A length of magnesium ribbon was added to the solution and stirred. The highest temperature reached was measured.

Experiment 2

Experiment 1 was repeated using solution **B** instead of solution **A**. The initial and highest temperatures were measured as before.

Experiment 3

Experiment 1 was repeated using solution C. The initial and highest temperatures were measured.

Experiment 4

Experiment 1 was repeated using solution D. The initial and highest temperatures were measured.

Experiment 5

Experiment 1 was repeated using solution E. The initial and highest temperatures were measured.

Use the thermometer diagrams in the table on page 6, to record the initial and highest temperatures in each experiment.

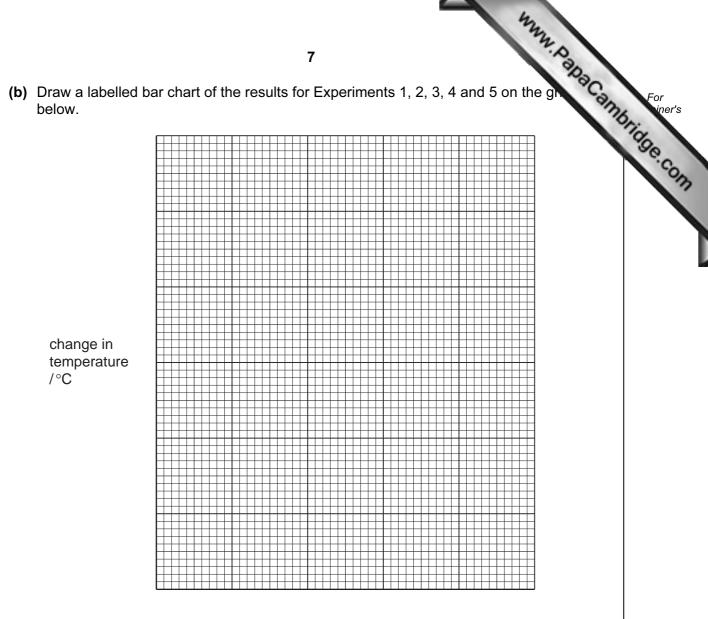
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solution of sulfuric acid	thermometer diagram	initial temperature /°C	thermometer diagram	highest temperature /°C	change in temperature /°C
Α	30 -25 -20		35		
В	30 -25 -20		- 40 - 35 30		
С	30 -25 -20		35		
D	30 -25 -20		35 -30 -25		
E	-30 -25 -20		30 -25 -20		

[4]

(a) Work out the temperature change for each experiment and record the values in the table. [1]

change in temperature /°C



Use the results and observations to answer the following questions.

(c)	Wh acid	at type of chemical reaction occurs when magnesium reacts with dilute sulfuric d?	
			[1]
(d)	(i)	Which Experiment produced the largest temperature change?	
			[1]
	(ii)	Suggest why this Experiment produced the largest temperature change.	
			[1]

(e)	Pre	edict the effect on the temperature changes that would happen if	Can
	(i)	equal masses of magnesium powder were used in the Experiments.	110
			[1]
	(ii)	40 cm ³ of dilute sulfuric acid was used in Experiment 1.	
			[1]
	(iii)	Explain your answer to (e)(ii).	
			[1]
(f)	Giv	ve one possible source of experimental error in this investigation.	
			[1]

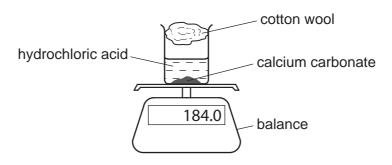
[Total: 16]

5 Three aqueous solutions K, L and M, were analysed. L was a solution of sodium hyd The tests on the solutions and some of the observations are in the table. Complete the observations in the table. Do not write any conclusions in the table.

www.PapaCambridge.com observations tests (a) Appearance of the solutions. solution K colourless liquid solution L colourless liquid solution M colourless liquid (b) Universal Indicator paper was used to test the pH of each solution. solution K pH 10 solution L [1] pH _____ solution M pH 2 (c) tests on solution K (i) Drops of solution K were added to copper sulfate solution in a test-tube. pale blue precipitate formed Excess of solution **K** was then added to the test-tube. deep blue solution formed (ii) Experiment (c)(i) was repeated using aqueous aluminium sulfate instead of aqueous copper sulfate. white precipitate formed insoluble in excess (iii) A few drops of nitric acid and silver nitrate solution were added to solution K. no visible reaction (d) tests on solution L (i) Experiment (c)(i) was [1] repeated using solution L. (ii) Experiment (c)(ii) was repeated using solution L. test on solution M (e) Experiment (c)(iii) was repeated using solution M. white precipitate formed

(f)	What conclusions can you make about solution K ?	Cal
		[2]
(g)	What conclusions can you make about solution M ?	
		[2]

6 Dilute hydrochloric acid was added to excess calcium carbonate in a beaker as shown.



The beaker was placed on a balance and the mass of the beaker and contents recorded every minute.

The results are shown in the table.

mass of beaker and contents/g	1 2 2 1 1 1	178.0	175.6	174.6	174.0	174.0
time/min	0	1	2	3	4	5

iner's

[Total: 9]

(a) Plot the results on the grid and draw a smooth line graph.



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(D)	Show clearly on your graph how you worked out your answer.	
		[2]
(c)	Why does the mass of the beaker and contents decrease?	
		[1]
(d)	Suggest the purpose of the cotton wool.	
		[1]
(e)	After how long did the reaction finish?	
		[1]
(f)	A second experiment was carried out using hydrochloric acid at a lower temperature On the grid sketch a curve to show the expected results for this experiment. Label this curve C .	[2]

[Total: 12]

[2]

[5]

Leaves from trees contain a mixture of coloured pigments which are not soluble in wa

7

www.PapaCambridge.com student was given these two instructions to investigate the pigments in the leaves. 1. Crush some leaves to extract the coloured pigments. 2. Use the liquid extract to find the number of coloured pigments in the leaves. (a) What would the student need in order to effectively carry out instruction 1? **(b)** Describe an experiment to carry out instruction 2. A space has been left below if you want to draw a diagram to help answer the question. [Total: 7]

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