

Candidate Name _____

Centre Number

Candidate
Number

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**International General Certificate of Secondary Education
CAMBRIDGE INTERNATIONAL EXAMINATIONS**

PHYSICAL SCIENCE
PAPER 5 Practical Test

0652/5

MAY/JUNE SESSION 2002

1 hour 30 minutes

Candidates answer on the question paper.
Additional materials:
As listed in Instructions to Supervisors.

TIME 1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

INFORMATION FOR CANDIDATES

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

Chemistry practical notes for this paper are printed on page 8.

FOR EXAMINER'S USE

1	
2	
TOTAL	

This question paper consists of 7 printed pages and 1 blank page.

- 1 Solid **P** is either potassium carbonate or potassium hydrogencarbonate.

Carry out the following tests to enable you to decide the name of solid **P**.

- (a) Carry out your own experiment to decide whether **P** is soluble in cold or hot water. Briefly describe what you did and state your conclusion.

.....

[2]

- (b) Make about 15 cm³ of a solution of **P** in the large test-tube.

- (i) Add a few drops of Universal Indicator. Record the colour of the solution and suggest its pH.

colour

pH = [1]

- (ii) Heat the mixture from (i) to boiling and maintain the boiling for about 2 minutes. Record all your observations.

observations
[2]

- (c) Place a small amount of **P** in a dry hard glass test-tube. Heat strongly and test any gas with a glowing splint and limewater.

Record your observations and conclusions below.

Keep the residue for test (e).

glowing splint.....

limewater

name of gas given off [2]

- (d) Make about 5 cm^3 of a solution of **P** in a test-tube. Add 5 cm^3 of dilute nitric acid, followed by 2 cm^3 of aqueous barium nitrate. How do your observations differ from the test for a sulphate?

.....
.....
.....[2]

- (e) Dissolve the cooled residue from (c) in a small amount of water. Add a little solid ammonium chloride and warm. Identify any gas given off.

test

name of gas[2]

- (f) • The reaction of potassium carbonate with hydrochloric acid is exothermic.
• The reaction of potassium hydrogencarbonate with hydrochloric acid is endothermic.

Carry out a test of your own to decide whether **P** is potassium carbonate or potassium hydrogencarbonate. Briefly describe what you do, including any measurements that you make.

.....
.....
.....
.....
.....
.....[3]

- (g) Name solid **P**[1]

- 2 You are going to investigate how the current flowing in a wire changes with its length.

The apparatus is set up for you as shown in Fig. 2.1.

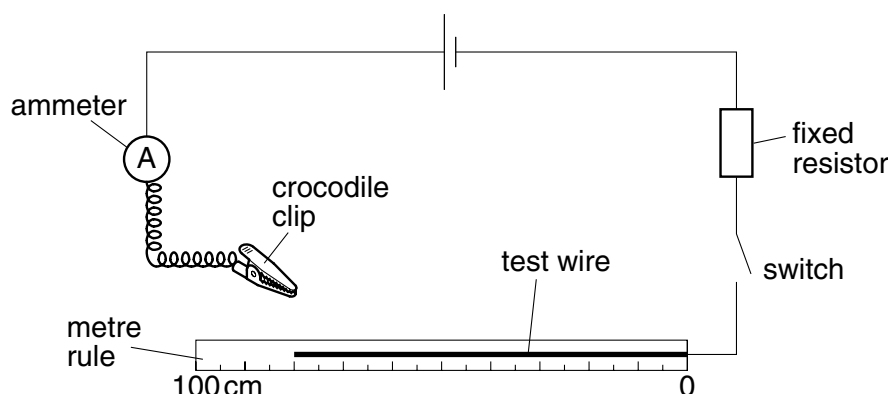


Fig. 2.1

- (a) Write down the value of the voltage of the cell, provided by the supervisor.

cell voltage = V

- (b)
- Make sure the switch is open.
 - Attach the crocodile clip to the wire at the 80 mm (8 cm) mark.
 - Close the switch.
 - Read the current, I , and record it in the table.
 - Open the switch.

length l /mm	current I /mA
80	

[3]

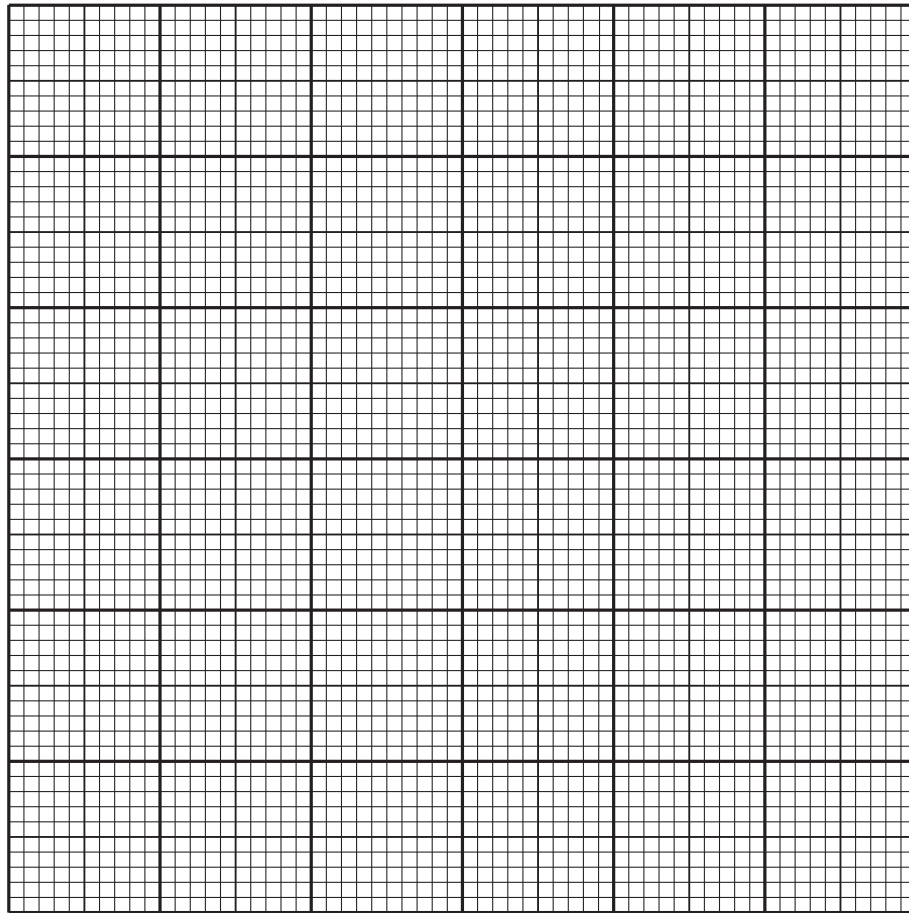
- (c) Repeat the procedure for **five** further lengths, l , of wire.

Record the lengths and currents in the table.

[2]

- (d) Plot a graph of current, I , (vertical axis) against length, l and draw a suitable curve through your points.

current, I/mA



length, l/mm

[3]

- (e) Using your graph, determine the current flowing through an identical piece of wire of length 1000 mm.

current = mA

[1]

- (f) Using the answer from (e), calculate the total resistance of the circuit using the formula

$$R = \frac{E \times 1000}{I}$$

E is the value of the voltage given to you by the supervisor.

resistance = ohms [2]

- (g) Ohm's Law states that the current through a wire is directly proportional to the voltage across its ends.

Given a variable resistor and a voltmeter, briefly explain how you would carry out an experiment to verify Ohm's Law. Draw a diagram of the circuit you would use.

.....

.....

.....

.....

[4]

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CHEMISTRY PRACTICAL NOTES

Test for anions

<i>anion</i>	<i>test</i>	<i>test result</i>
carbonate (CO_3^{2-})	add dilute acid	effervescence, carbon dioxide produced
chloride (Cl^-) [in solution]	acidify with dilute nitric acid, then add aqueous silver nitrate	white ppt.
nitrate (NO_3^-) [in solution]	add aqueous sodium hydroxide, then aluminium foil; warm carefully	ammonia produced
sulphate (SO_4^{2-}) [in solution]	acidify, then add aqueous barium chloride <i>or</i> aqueous barium nitrate	white ppt.

Test for aqueous cations

<i>cation</i>	<i>effect of aqueous sodium hydroxide</i>	<i>effect of aqueous ammonia</i>
ammonium (NH_4^+)	ammonia produced on warming	—
copper(II) (Cu^{2+})	light blue ppt., insoluble in excess	light blue ppt., soluble in excess, giving a dark blue solution
iron(II) (Fe^{2+})	green ppt., insoluble in excess	green ppt., insoluble in excess
iron(III) (Fe^{3+})	red-brown ppt., insoluble in excess	red-brown ppt., insoluble in excess
zinc (Zn^{2+})	white ppt., soluble in excess, giving a colourless solution	white ppt., soluble in excess, giving a colourless solution

Test for gases

<i>gas</i>	<i>test and test result</i>
ammonia (NH_3)	turns damp litmus paper blue
carbon dioxide (CO_2)	turns lime water milky
chlorine (Cl_2)	bleaches damp litmus paper
hydrogen (H_2)	‘pops’ with a lighted splint
oxygen (O_2)	relights a glowing splint