Electricity and Chemistry

Question Paper 1

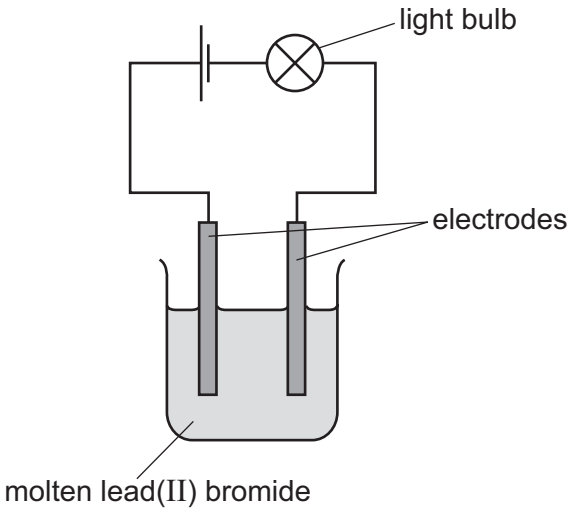
Level	IGCSE
Subject	Chemistry
Exam Board	CIE
Topic	Electricity and Chemistry
Sub-Topic	
Paper Type	Alternative to Practical
Booklet	Question Paper 1

Time Allowed: **58 minutes**

Score: **/48**

Percentage: **/100**

1 Electricity was passed through molten lead(II) bromide using the apparatus shown.



The formation of a brown gas was observed at the positive electrode.

(a) Give **one** other expected observation.

..... [1]

(b) Name a non-metal that could be used for the electrodes.

..... [1]

(ii) Suggest why iron is not used for the electrodes.

..... [1]

(c) Name the brown gas formed.

..... [1]

(ii) Suggest the result of testing this gas with damp blue litmus paper.

..... [1]

(d) Name the product formed at the negative electrode.

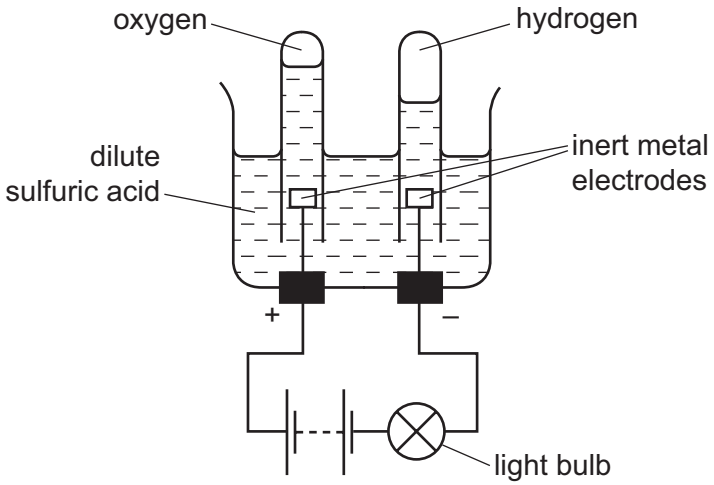
..... [1]

(e) State **one** safety precaution that should be used when doing this experiment.

..... [1]

[Total: 7]

2 Electricity was used to break down dilute sulfuric acid using the apparatus shown.



(a) What name is given to this process?

..... [1]

(b) Give **one** observation which could be made during this experiment.

..... [1]

(c) Suggest a suitable metal for the inert metal electrodes.

..... [1]

(d) Give a test for oxygen gas.

test .....

result .....

[2]

(e) Why does hydrogen form at the negative electrode?

..... [1]

(f) The experiment was repeated using concentrated hydrochloric acid.

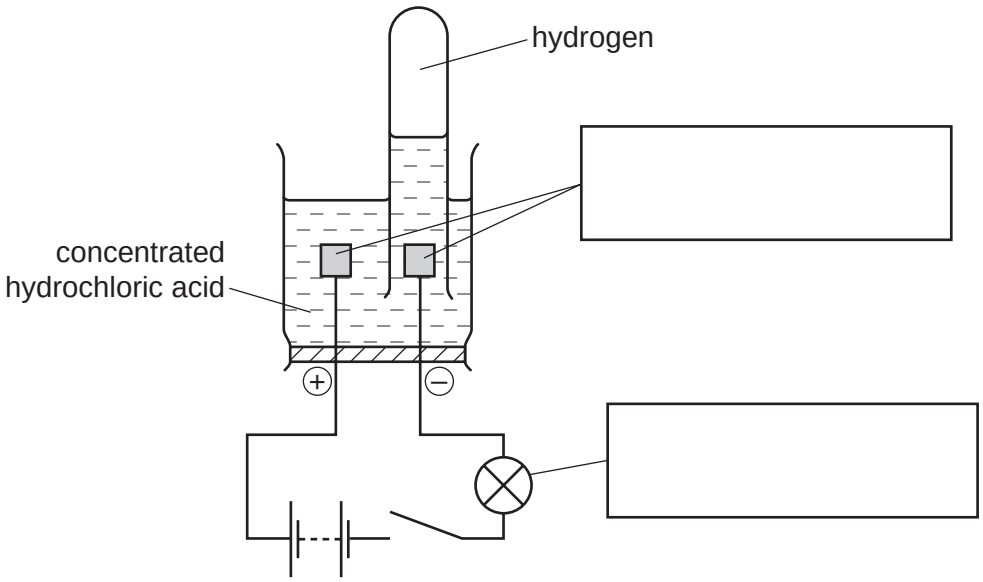
Explain why this experiment was carried out in a fume cupboard.

.....

..... [2]

[Total: 8]

3 Electricity was passed through a solution of concentrated hydrochloric acid using the apparatus shown.



(a) Complete the boxes to identify the parts of the apparatus labelled. [2]

(b) Describe the test for hydrogen.

test .....

result ..... [2]

(c) Describe how a sample of the gas given off at the positive electrode could be collected and its volume measured.

.....

.....

..... [2]

(d) The experiment was repeated using a concentrated aqueous solution of sodium chloride instead of hydrochloric acid.

(i) State the name of the solution formed.

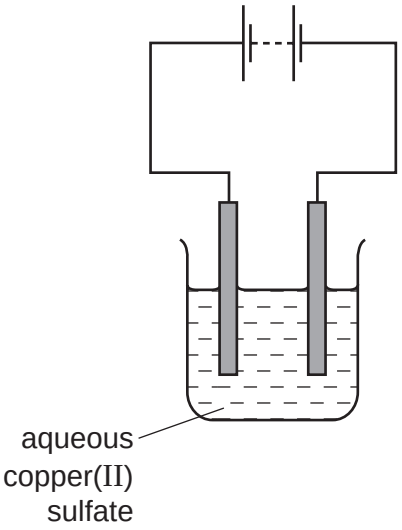
..... [1]

(ii) Give a test to show the presence of this product.

..... [1]

[Total: 8]

4 Electricity was passed through aqueous copper(II) sulfate using inert electrodes as shown in the diagram below.
Copper was deposited at one of the electrodes.



(a) Name a suitable material for the electrodes.

..... [1]

(b) At which electrode was copper deposited?

..... [1]

(c) Give **one** other observation seen during the electrolysis.

..... [1]

The electrode at which copper was deposited was removed at intervals, washed, dried and weighed.
The results are shown in the table on page 4.

(d) **(i)** Suggest how the electrode was washed?

..... [1]

(ii) How could the electrode be dried quickly?

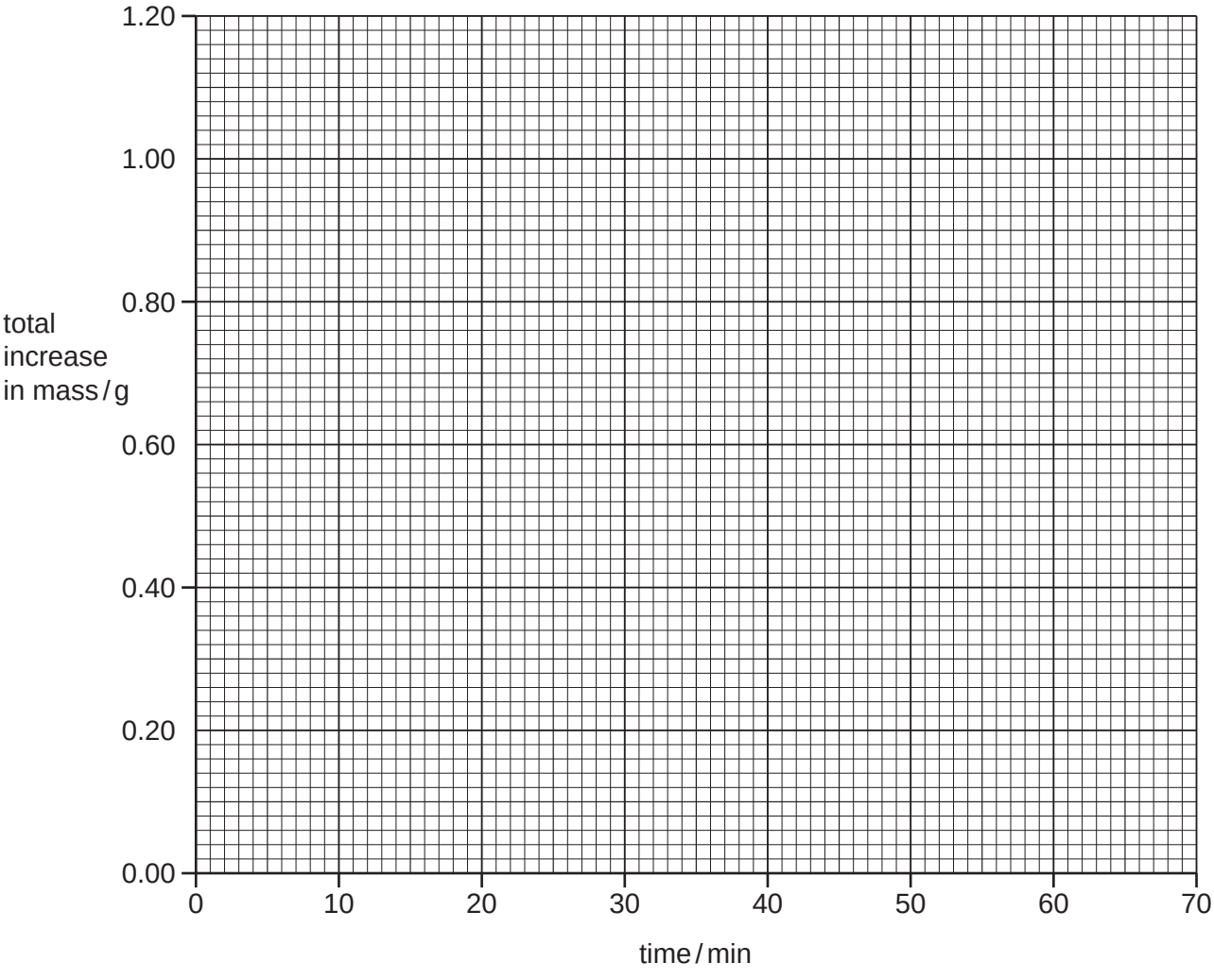
..... [1]

Table of results

time / min	mass of electrode / g	total increase in mass / g
0	3.75	0.00
10	4.00	0.25
20	4.25	0.50
30	4.50	
40	4.75	
50	4.90	
60	4.90	
70	4.90	

(e) Complete the table by calculating the total increase in mass for the remaining time intervals. [1]

(f) Plot the points on the grid below. Draw a graph with two intersecting straight lines.



[3]

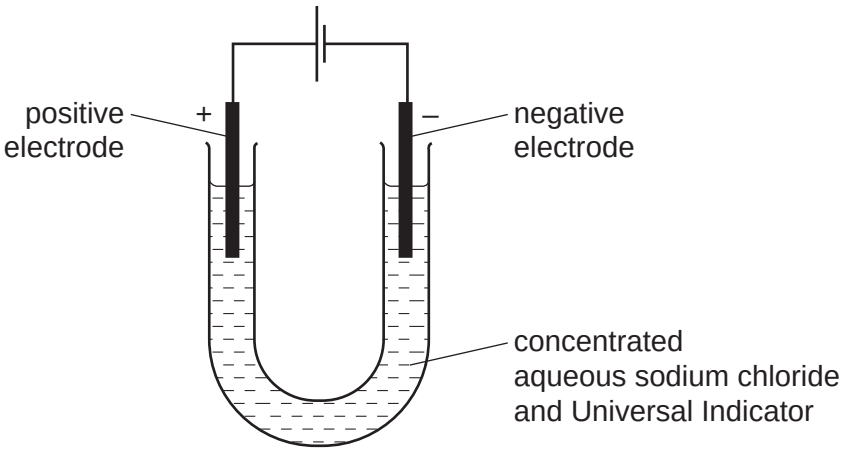
(g) Suggest why the last three readings were the same.

.....

..... [1]

[Total: 10]

5 A concentrated solution of sodium chloride was electrolysed using the apparatus below.



One observation noted was that the Universal Indicator turned purple at the negative electrode.

(a) What observation would be made at **both** electrodes?

..... [1]

(b) Why did the indicator turn purple at the negative electrode?

..... [1]

(c) (i) Name the product formed at the positive electrode.

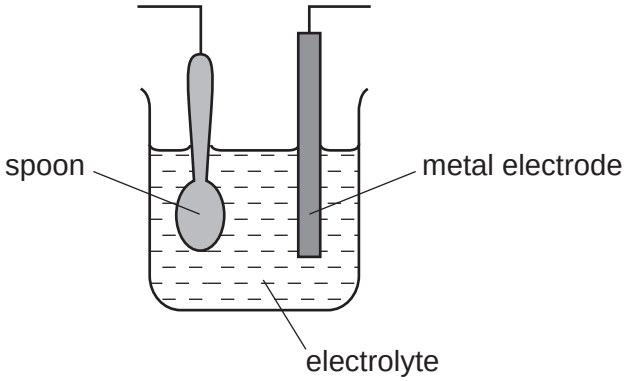
..... [1]

(ii) Suggest the effect of this product on the Universal Indicator.

..... [1]

[Total: 4]

6 A steel spoon can be coated in silver using electrolysis. The spoon must be very clean and free of grease.



(a) Suggest

(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) Which electrode should be the spoon?

.....

[1]

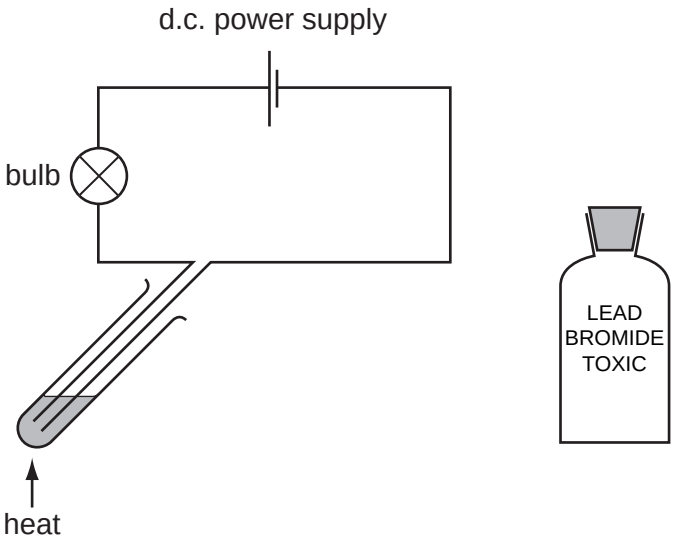
(c) Identify the metal from which the other electrode is made.

.....

[1]

[Total: 5]

7 The diagram shows an experiment to pass electricity through lead bromide.
Electricity has no effect on solid lead bromide.



(a) (i) Clearly label the electrodes on the diagram. [1]

(ii) Suggest a suitable material to make the electrodes.

..... [1]

(b) Give two observations expected when the lead bromide is heated to melting point.

1. .....

2. ..... [2]

(c) State two different safety precautions when carrying out this experiment.

1. .....

2. ..... [2]

[Total: 6]