



Rewarding Learning

General Certificate of Secondary Education
2011–2012

Science: Single Award (Modular)

Chemical Patterns and our Environment

Module 3

Higher Tier

[GSC32]

TUESDAY 28 FEBRUARY 2012

11.00 am–11.45 am



Centre Number

71

Candidate Number

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

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

Answer **all seven** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 45.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

A Data Leaflet is provided for use with this paper.

For Examiner's
use only

Question Number	Marks
1	
2	
3	
4	
5	
6	
7	

Total
Marks

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1 (a) Complete the sentence below.

The number of _____ plus the number of _____
in an atom is called the **mass number** of that element. [2]

(b) An oxygen atom has eight electrons.

In the space below, draw a diagram to show how these eight electrons are arranged in an atom of oxygen.

[2]

(c) Magnesium metal burns in air to produce the compound magnesium oxide.

The formula for magnesium oxide is MgO.

Calculate the **total number** of particles in magnesium oxide.

You may find your Data Leaflet helpful.

protons _____

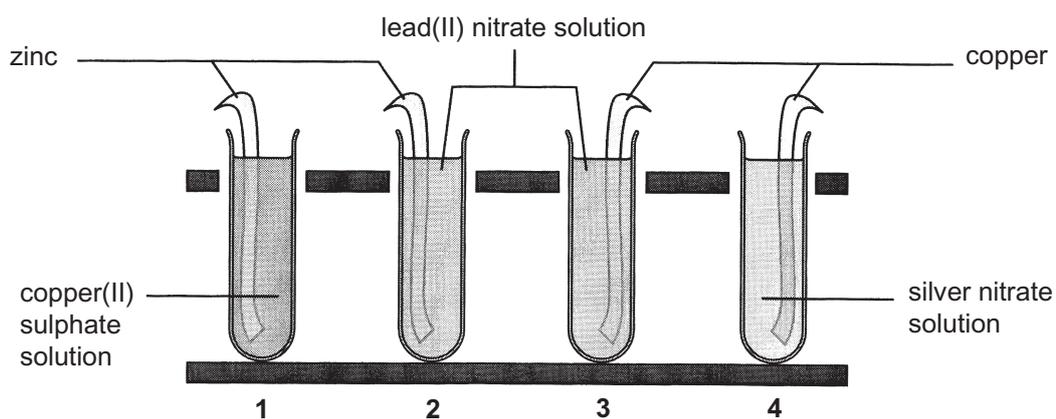
electrons _____

neutrons _____

[3]

Examiner Only	
Marks	Remark

- 2 David did an experiment to investigate which metals are the most reactive. He set up the apparatus as shown in the diagram below.



He recorded his results in a table as follows:

Test tube	Appearance of solution at start	Appearance of metal at start	Appearance of solution after 2 hours	Appearance of metal after 2 hours
1	blue	silvery colour	colourless	reddish brown deposit
2	colourless	silvery colour	colourless	greyish white deposit
3	colourless	reddish brown colour	colourless	silvery colour no deposit
4	colourless	reddish brown colour	blue	greyish deposit

Use this information to answer the following questions.

- (a) What name is given to a reaction in which one metal takes the place of another metal?

_____ [1]

- (b) In which test tube, 1, 2, 3, or 4, was there no chemical reaction?

_____ [1]

- (c) Name the reddish brown deposit on the zinc metal in test tube 1.

_____ [1]

Examiner Only

Marks Remark

(d) The solution in test tube 1 lost its blue colour. Explain how this happened.

_____ [1]

(e) Which of the metals involved is the most reactive?

Circle the correct answer.

copper **silver** **zinc** **lead** [1]

(f) Explain fully what has happened in test tube 4.

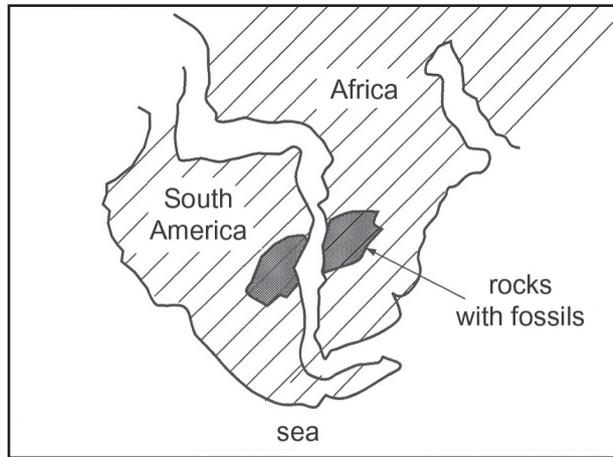
_____ [2]

Examiner Only

Marks Remark

- 4 Alfred Wegener put forward his theory on the formation of the continents in 1915. Ideas on this subject had been debated since 1597 but it was not until 1960 that scientists accepted his theory as being correct.

Below is a map showing the relative positions of South America and Africa millions of years ago.



- (a) Describe Wegener's theory including one piece of evidence that he gave to support it.

[3]

- (b) Before 1960 some scientists rejected Wegener's theory. Give one reason why it was rejected.

[1]

Examiner Only	
Marks	Remark

5 Food additives can be divided into groups.

(a) Complete the table below.

Food Additive	Function
Flavouring	
	Stops fats from going rancid (off)
Emulsifiers	
	Keeps the food at the right pH

[4]

(b) E142 is a green colouring which is added to some vegetables.

Give **two** disadvantages of adding colouring to food.

1. _____

2. _____ [2]

(c) Describe the advantages and disadvantages of testing food additives on animals.

_____ [3]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

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