



General Certificate of Secondary Education
2011–2012

Science: Single Award (Modular)
Chemical Patterns and our Environment
Module 3
Foundation Tier
[GSC31]

WEDNESDAY 9 NOVEMBER 2011
9.15 am–10.00 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

- 1 (a) Some chemicals are dangerous and they have **symbols** on their containers.

What name is given to these symbols?

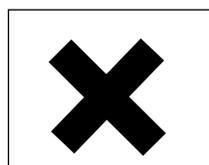
Circle the correct answer.

universal **security** **hazard** **safety** [1]

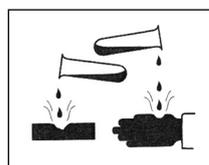
- (b) Why are symbols better than words?

_____ [1]

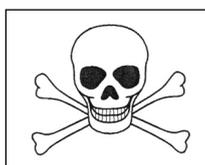
- (c) Below are four symbols.



A



B



C



D

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- (i) Which symbol **A**, **B**, **C** or **D** should be put on a bottle of toxic weedkiller?

_____ [1]

- (ii) Oven cleaner is corrosive. Which symbol **A**, **B**, **C** or **D** should be put on a bottle of oven cleaner?

_____ [1]

- (iii) Give the name of a substance on which you could put symbol **D**.

_____ [1]

Examiner Only

Marks Remark

- 2 Red cabbage leaves can be used to make a coloured liquid which changes colour in acids and alkaline solutions.



- (a) What name is given to a substance which changes colour in acids and alkalis?

_____ [1]

- (b) Give the name of another plant which can be used for this type of experiment.

_____ [1]

- (c) The colours of pH paper in different liquids are given below.

colour	red	orange	yellow	light green	dark green	light blue	dark blue
pH	1	3	5	7	9	11	13

- (i) Use the information given above to complete the table below.

Name	pH	Colour
lemon juice		orange
sodium carbonate		dark green
calcium hydroxide	13	

[3]

- (ii) Name the strongest alkali from the chemicals listed in the table.

_____ [1]

Examiner Only	
Marks	Remark

3 Given below are five types of food additives and their functions.

(a) Match the food additive to its function by drawing straight lines.

One has been done for you.

Food additive	Function
Anti-oxidants	Controls pH
Flavourings	Alternative to sugar
Sweeteners	Improves taste
Emulsifiers	Stabilises oil and water mixtures
Colourings	Stops fats from going off
	Makes food look attractive

[4]

(b) All additives have a number which starts with a letter of the alphabet.

What is this letter?

_____ [1]

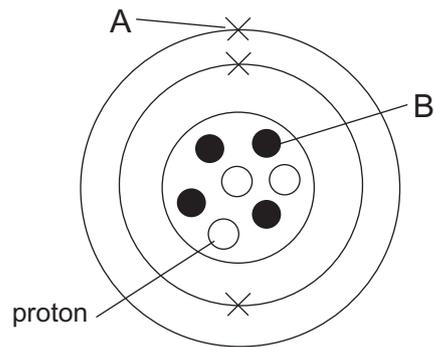
(c) Give two problems which are often linked to putting additives in food.

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

4 The diagram shows the structure of an atom.



(a) Name the particles labelled A and B.

A _____ B _____ [2]

(b) What is the **atomic mass** of the atom shown above?

_____ [1]

(c) Complete the following sentences.

Choose from:

sodium : metal : electrons : core

nucleus : protons : lithium : neutrons

The part of the atom where the protons are found is called
the _____ .

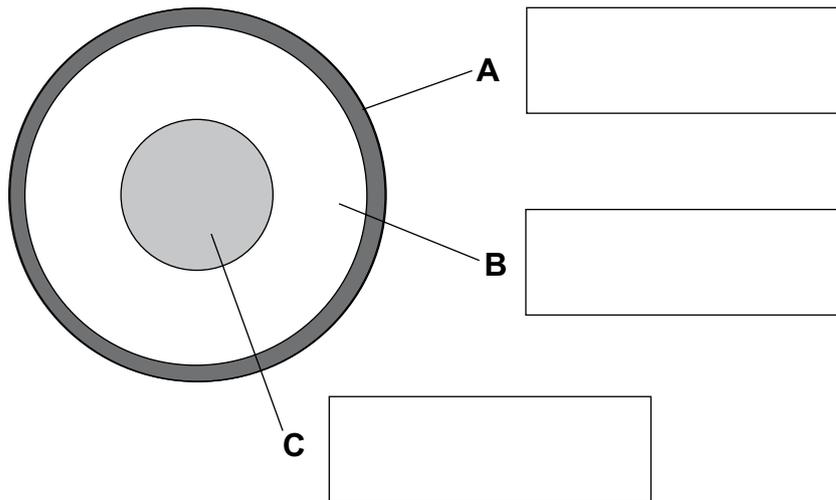
In an atom, the number of electrons is always equal to the number
of _____ .

The atom shown above has three protons. This element is
called _____ . [3]

Examiner Only

Marks Remark

5 The diagram below shows the structure of the Earth.



(a) Complete the diagram by naming the parts labelled **A**, **B** and **C**. [3]

(b) Complete the following sentences.

Choose from:

Richter tsunamis lava tectonic magma

The intensity of earthquakes is measured on the _____ scale.

When a volcano erupts under the sea large waves called _____ can be formed.

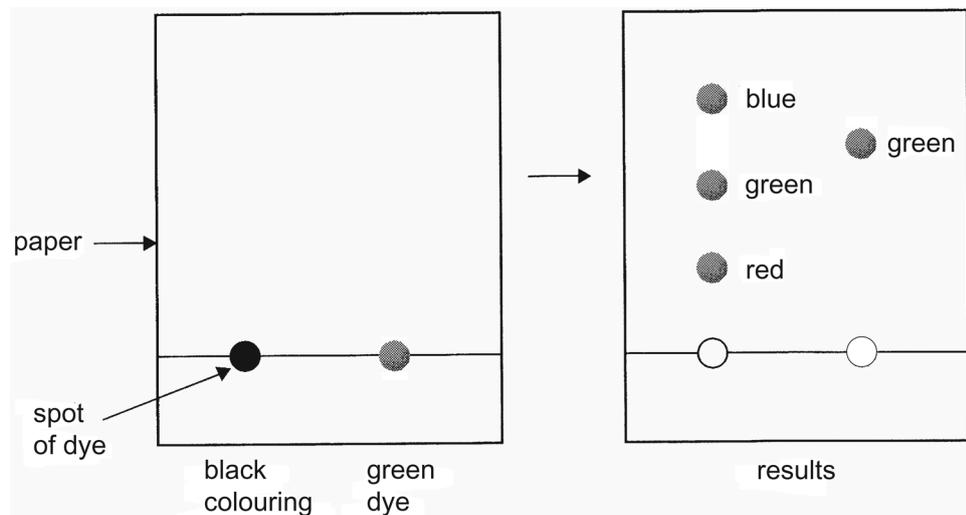
Earthquakes are formed when _____ plates rub against each other.

Deep inside a volcano there is a liquid called _____. [4]

Examiner Only	
Marks	Remark

- 6 Emma investigated if a green dye was used in making a black colouring used in baking.

She carried out an experiment and obtained the following results.



- (a) What name is given to this type of experiment?

_____ [1]

- (b) Which dye from the black colouring was the most soluble in this experiment?

_____ [1]

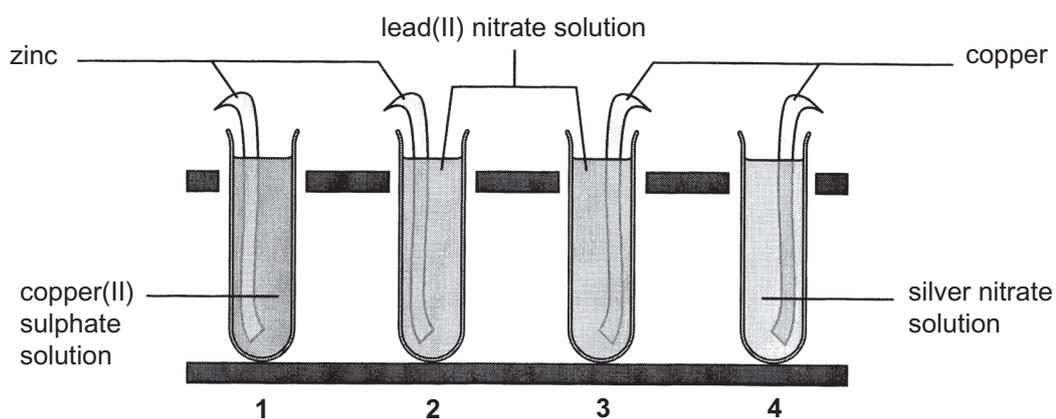
- (c) Explain fully what Emma has found out from her results.

 _____ [2]

Examiner Only

Marks Remark

- 7 The diagram below shows four solutions into which strips of metal were placed.



After several hours the following results were obtained.

Test tube 1: solution lost its blue colour and a reddish brown deposit was seen on the metal strip.

Test tube 2: solution remained colourless and a greyish white deposit was seen on the metal strip.

Test tube 3: solution remained colourless and the metal strip remained shiny with no deposit.

Test tube 4: solution turned blue and a deposit was seen on the metal strip.

Use this information to answer the following questions.

(a) Why are reactions like these described as displacement reactions?

_____ [1]

(b) Name the reddish brown deposit formed on the zinc in test tube 1.

_____ [1]

(c) Why did the solution lose its blue colour in test tube 1?

_____ [1]

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Marks Remark

(d) Explain fully the result for test tube 3.

_____ [2]

(e) Two products were formed in test tube 4. Name these two products.

_____ and _____ [2]

(f) Which of the metals involved is the least reactive?

Circle the correct answer.

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

(g) Explain fully why sodium would not be a suitable metal for this experiment.

_____ [2]

THIS IS THE END OF THE QUESTION PAPER

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