

New
Specification



Centre Number

71	
----	--

Candidate Number

--

General Certificate of Secondary Education
2012–2013

Science: Single Award

Unit 2 (Chemistry)

Foundation Tier

[GSS21]

TUESDAY 28 FEBRUARY 2012

11.00 am–12.00 noon



TIME

1 hour.

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 eight** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 60.
Quality of written communication will be assessed in question **8(d)**.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
A Data Leaflet, which includes a Periodic Table of the elements, is provided for your use.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	

Total Marks	
--------------------	--



BLANK PAGE

1 Stepladders, used by window cleaners, are made of aluminium.



© BrandX Pictures / Thinkstock

(a) Give **three** reasons why aluminium is a suitable material for making stepladders.

Choose from:

conductor : flexible : low density

strong : high melting point : hard

1. _____

2. _____

3. _____ [3]

(b) Why would it be dangerous if an aluminium ladder touched an overhead electric cable?

_____ [1]

(c) Name another material which could be used to make stepladders.

_____ [1]

Examiner Only

Marks Remark

2 (a) Below are the names of four household substances.

Using lines, link each substance to the chemical it contains.

One has been done for you.

Substance	Chemical
Vinegar	sodium hydrogencarbonate
Bathroom cleaner	magnesium hydroxide
Baking soda	ethanoic acid
Milk of magnesia	ammonia solution
	sodium chloride

[3]

(b) The picture below shows a cylinder of gas.



© Crown copyright

(i) Name the hazard symbol shown on this cylinder.

_____ [1]

(ii) Give **two** reasons why hazard symbols, rather than words, are placed on some containers.

1. _____

2. _____ [2]

3 A label from a bottle of soft drink is shown below.

<h2>Juice to Go!</h2> <p>Bursting with flavour</p>	<p>Ingredients</p> <p>Water Sugar Citric acid Colouring Preservative Flavouring</p>
---	--

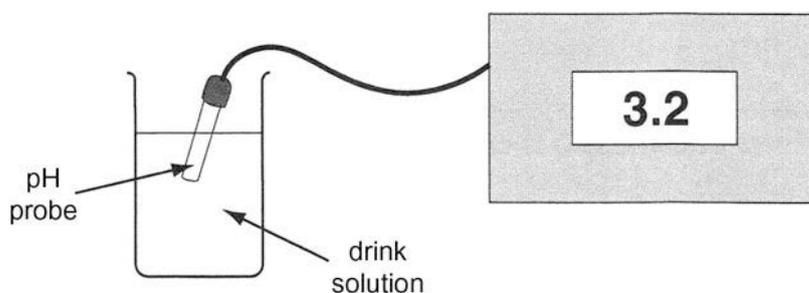
(a) Name the ingredient on the label that gives the drink a low pH value.

_____ [1]

(b) Name a suitable indicator which could be used to find the pH value of this drink.

_____ [1]

(c) The diagram shows a pH probe.



Give **one** advantage of using a pH probe to measure the pH rather than using a chemical indicator.

_____ [1]

(d) Complete the following sentence.

A solution with a pH greater than 7 is described as _____ . [1]

Examiner Only	
Marks	Remark

- 4 Given below is some information on the disposal of waste in Northern Ireland.

Wheelie bins contain many different kinds of waste including food waste, paper, glass, metal, textiles and household dust.

In Northern Ireland 85% of waste goes into landfill sites where it is buried and covered with clay. The rest is recycled.

Some of the waste decomposes giving off the polluting gas, methane, and also produces foul smelling liquids that are unpleasant and can leak into water supplies.

The table below shows the time it takes for some waste items to break down.

Waste item	Time taken
Aluminium can	80–100 years
Apple core	8 weeks
Glass bottle	500 years
Newspaper	6 weeks
Plastic bag	10–20 years
Plastic bottle	Greater than 500 years

Use the information provided and your own knowledge to answer the following questions.

- (a) Name the item which will lie in the landfill site for the longest period of time.

_____ [1]

- (b) Apart from newspapers list all the other materials in the table which should be recycled. Explain fully why you have chosen these materials.

List _____

Explanation _____

_____ [3]

Examiner Only

Marks

Remark

- (c) (i) Apple cores are described as biodegradable. Explain fully what is meant by the term biodegradable.

_____ [2]

- (ii) Suggest another material from the table which could also be biodegradable.

_____ [1]

- (d) Apart from the time taken to decompose, use the information opposite to give **two** other **disadvantages** of burying waste in landfill sites.

1. _____

2. _____ [2]

- (e) (i) Calculate the percentage of waste in Northern Ireland that is recycled.
(Show your working out.)

_____ % [2]

- (ii) Give **two** ways local authorities can encourage people to recycle more waste.

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

6 The fingerprint shown below was found on a stolen black TV set.



© Astrid & Hanns-Frieder Michler / Science Photo Library

There are four types of fingerprints.

(a) Name the type of fingerprint shown above.

Choose from:

arch : whorl : loop : composite

_____ [1]

(b) What type of powder would be used to show the fingerprint on the TV set?

_____ [1]

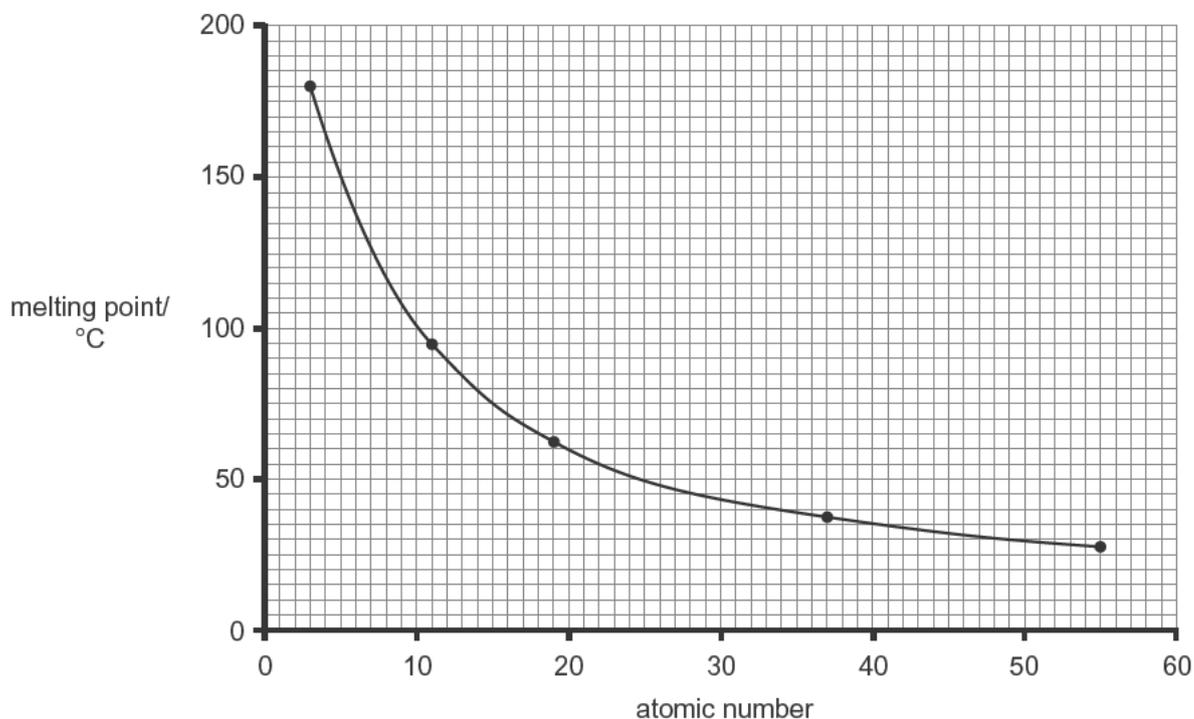
(c) Explain fully how a fingerprint could be obtained from the TV set for evidence use.

 _____ [3]

Examiner Only	
Marks	Remark

- 7 The graph below shows the relationship between the melting point and atomic number of five elements.

The five elements are all from the same group of the Periodic Table.



You may find your Data Leaflet helpful to answer the questions below.

- (a) (i) What is the atomic number of the element with the highest melting point?

_____ [1]

- (ii) Name this element. _____ [1]

- (b) (i) What is the melting point of the element with atomic number 37?

_____ °C [1]

- (ii) Name this element. _____ [1]

- (c) To which group of the Periodic Table do these elements belong?

Group _____ [1]

Examiner Only

Marks Remark

(d) Describe fully the trend shown by the graph.

_____ [2]

(e) The table below lists some information about the elements called halogens. At the melting point an element changes from a solid to a liquid. At the boiling point an element changes from a liquid to a gas.

Element	Melting point/ °C	Boiling point/ °C	Mass number
Fluorine	-220	-188	19
Chlorine	-101	-35	36
Bromine	-7	59	80
Iodine	113	183	127

(i) Name the element in the table which has the lowest melting point.

_____ [1]

(ii) Name the halogen which is a **liquid** at room temperature (20 °C).

_____ [1]

(iii) Complete the following sentence to describe a trend shown by the results.

As the boiling point of the elements _____

the mass number _____ [1]

Examiner Only

Marks Remark

- 8 Mineral water contains many different ions which give it a characteristic taste. The table below gives the information shown on the label of a popular brand of mineral water.

Ions present	Concentration/arbitrary units
Magnesium	18
Potassium	3
Calcium	113
Sodium	17
Chloride	32
Hydrogencarbonate	430
Nitrate	11
Phosphate	1
Sulfate	2

- (a) (i) Using the information in the table, calculate the total concentration of the ions causing this mineral water to be hard.
(Show your working out.)

_____ arbitrary units [2]

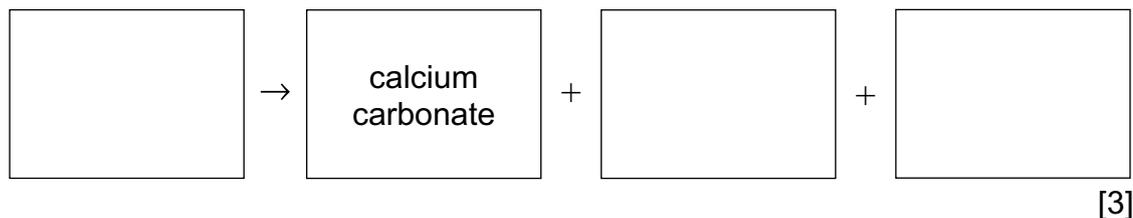
- (ii) Name the ion in the table which would be thermally decomposed if the water was boiled.

_____ [1]

Examiner Only	
Marks	Remark

- (b) Hard water can cause undesirable deposits of calcium carbonate, called 'fur', in kettles.

Complete the word equation to show how the 'fur' forms in kettles.



- (c) Explain what is meant by the term **hard water**.

[2]

- (d) Describe an experiment you could carry out in the laboratory to compare the hardness of bottled water to the hardness of the tap water in your school.

In this question you will be assessed on your written communication skills including the use of specialist terms.

[6]

- (e) Give **one** advantage of drinking hard water.

[1]

THIS IS THE END OF THE QUESTION PAPER

Examiner Only	
Marks	Remark

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA
will be happy to rectify any omissions of acknowledgement in future if notified.