



Rewarding Learning

General Certificate of Secondary Education
2017–2018

Centre Number

--	--	--	--	--

Candidate Number

--	--	--	--

Single Award Science Chemistry

Unit 2
Foundation Tier**[GSA21]****THURSDAY 22 FEBRUARY 2018, MORNING****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 ten** questions.**INFORMATION FOR CANDIDATES**

The total mark for this paper is 60.

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.

Quality of written communication will be assessed in Question **6(a)**.**For Examiner's
use only**

Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

**Total
Marks**

BLANK PAGE
(Questions continue overleaf)

2 Fingerprints are one type of evidence that can be collected at a crime scene.

(a) Name the two types of fingerprints shown below.

Choose from:

whorl

composite

arch

loop

(i)



[1]

(ii)



[1]

© Barloc / iStock / Thinkstock

(b) (i) Complete the following sentences about collecting a fingerprint from a crime scene.

Scientists dust powder over fingerprints to make them more visible. If the surface is _____ in colour then the scientist will use carbon black powder.

Fingerprints are very useful as evidence because they are _____ to every person. [2]

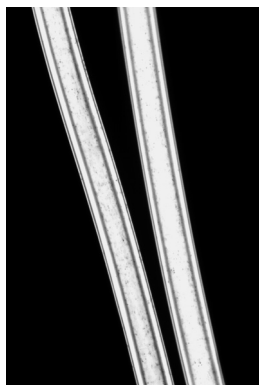
(ii) Apart from using powders, give **one** other way that forensic scientists can make fingerprints more visible.

[1]

(c) Fingerprints are now commonly used as a security measure. Describe **one** way in which fingerprint recognition is used for security.

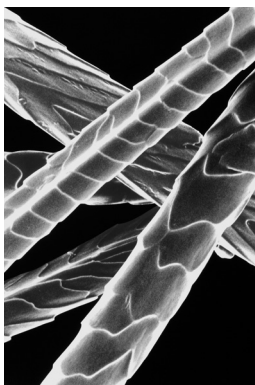
[1]

(d) Below are images of four fibres as seen under a microscope.



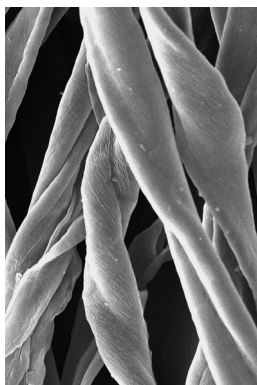
nylon

© R.E. Litchfield / Science Photo Library



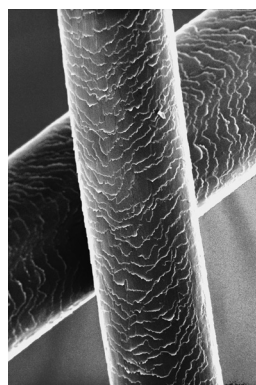
wool

© Science Photo Library



cotton

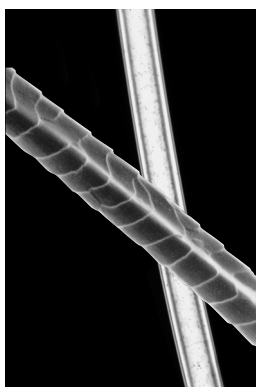
© Power and Syred / Science Photo Library



hair

© David M. Phillips / Science Photo Library

A scientist collected the fibres below from a crime scene.



© R.E. Litchfield / Science Photo Library and © Science Photo Library

(i) Using the images above, identify the two different fibres collected from the crime scene.

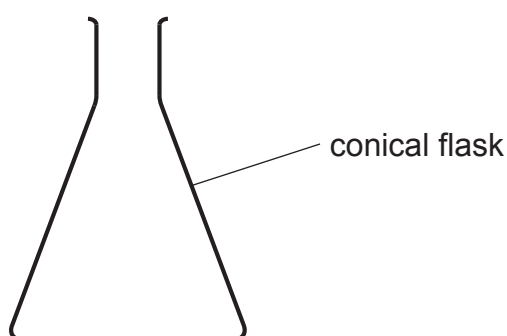
_____ and _____ [1]

(ii) Why might hairs collected at a crime scene be useful in helping to solve the crime?

[1]

- 4 A student wants to separate a mixture of soil and water. She decides to use filtration.

- (a)** Complete and label the diagram below to show how she could set up the apparatus needed to separate the soil from the water.



[2]

- (b) (i)** Complete the table below by placing a tick (✓) in the correct column. The first one has been done for you.

Mixture	Can be separated using filtration	Cannot be separated using filtration
salt and water		✓
sand and water		
sugar and water		

[1]

- (ii) Explain why filtration will **not** separate salt and water.

[1]

- (iii) Name **one** method that can be used to separate salt from water.

 [1]

Examiner Only	
Marks	Remark

- (c)** Use the information from the student's results to complete the table below.

Substance	Colour of blueberry indicator
weak acid	
strong acid	
neutral	green

[2]

- (d)** Another student had two beakers of colourless liquids; one was water and one was sodium hydroxide. Explain why the blueberry indicator could not be used to tell which was which.

[1]

- (e) Give **one** advantage of using a pH sensor (meter) rather than a chemical indicator.

[1]

Examiner Only	
Marks	Remark

BLANK PAGE
(Questions continue overleaf)

(c) The gas produced during this reaction is carbon dioxide.

(i) Name the chemical used to test for carbon dioxide.

[1]

(ii) Give the colour change observed during the test for carbon dioxide.

_____ to _____ [2]

(d) Sodium hydrogencarbonate has the formula NaHCO_3 .

(i) How many elements are represented by this formula?

 [1]

(ii) How many atoms are represented by this formula?

 [1]

Examiner Only	
Marks	Remark

Sources:

Q1 *Thinkstockphotos 121220443*

Q2 *Thinkstockphotos 843797524*

Science Photo Library H1200295

Science Photo Library H1200241

Science Photo Library H1200322

Science Photo Library C0175944

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.

SYMBOLS OF SELECTED IONS

Positive ions

Name	Symbol
Ammonium	NH_4^+
Chromium(III)	Cr^{3+}
Copper(II)	Cu^{2+}
Iron(II)	Fe^{2+}
Iron(III)	Fe^{3+}
Lead(II)	Pb^{2+}
Silver	Ag^+
Zinc	Zn^{2+}

Negative ions

Name	Symbol
Butanoate	$\text{C}_3\text{H}_7\text{COO}^-$
Carbonate	CO_3^{2-}
Dichromate	$\text{Cr}_2\text{O}_7^{2-}$
Ethanoate	CH_3COO^-
Hydrogencarbonate	HCO_3^-
Hydroxide	OH^-
Methanoate	HCOO^-
Nitrate	NO_3^-
Propanoate	$\text{C}_2\text{H}_5\text{COO}^-$
Sulfate	SO_4^{2-}
Sulfite	SO_3^{2-}

Data Leaflet

Including the Periodic Table of the Elements

For the use of candidates taking
Science: Chemistry,
Science: Double Award
or Science: Single Award

Copies must be free from notes or additions of any
kind. No other type of data booklet or information
sheet is authorised for use in the examinations

SOLUBILITY IN COLD WATER OF COMMON SALTS, HYDROXIDES AND OXIDES

Soluble
All sodium, potassium and ammonium salts
All nitrates
Most chlorides, bromides and iodides EXCEPT silver and lead chlorides, bromides and iodides
Most sulfates EXCEPT lead and barium sulfates Calcium sulfate is slightly soluble
Insoluble
Most carbonates EXCEPT sodium, potassium and ammonium carbonates
Most hydroxides EXCEPT sodium, potassium and ammonium hydroxides
Most oxides EXCEPT sodium, potassium and calcium oxides which react with water

gcse examinations chemistry

Group

1	H	Hydrogen	1
---	---	----------	---

† 90 – 103 Actinium series

$$\begin{matrix} a \\ \mathbf{X} \\ b \end{matrix}$$

x = atomic symbol

b = atomic number

140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	145 Pm Promethium 61	150 Sm Samarium 62	152 Eu Europium 63	157 Gd Gadolinium 64	159 Tb Terbium 65	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	169 Tm Thulium 69	173 Yb Ytterbium 70	175 Lu Lutetium 71
232 Th Thorium 90	231 Pa Protactinium 91	238 U Uranium 92	237 Np Neptunium 93	242 Pu Plutonium 94	243 Am Americium 95	247 Cm Curium 96	245 Bk Berkelium 97	251 Cf Californium 98	254 Es Einsteinium 99	253 Fm Fermium 100	256 Md Mendelevium 101	254 No Nobelium 102	257 Lr Lawrencium 103