

New  
Specification



*Rewarding Learning*

**General Certificate of Secondary Education  
2017–2018**

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**Single Award Science  
Chemistry**

Unit 2  
Foundation Tier

**[GSA21]**

**THURSDAY 22 FEBRUARY 2018, MORNING**

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**MARK  
SCHEME**

## General Marking Instructions

### Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

### The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

1 (a) Hazard symbol

Name



toxic



corrosive



explosive

flammable

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(b) The acid will burn the skin.

2 (a) (i) Whorl

(ii) Loop

(b) (i) White [1]  
unique [1]

(ii) Alternative light source/chemical developers

(c) **Description** of use in mobile phones/tablets

(d) (i) Nylon and wool

(ii) It could be matched to a suspect's hair

AVAILABLE MARKS

[2]

[1]

3

[1]

[1]

[2]

[1]

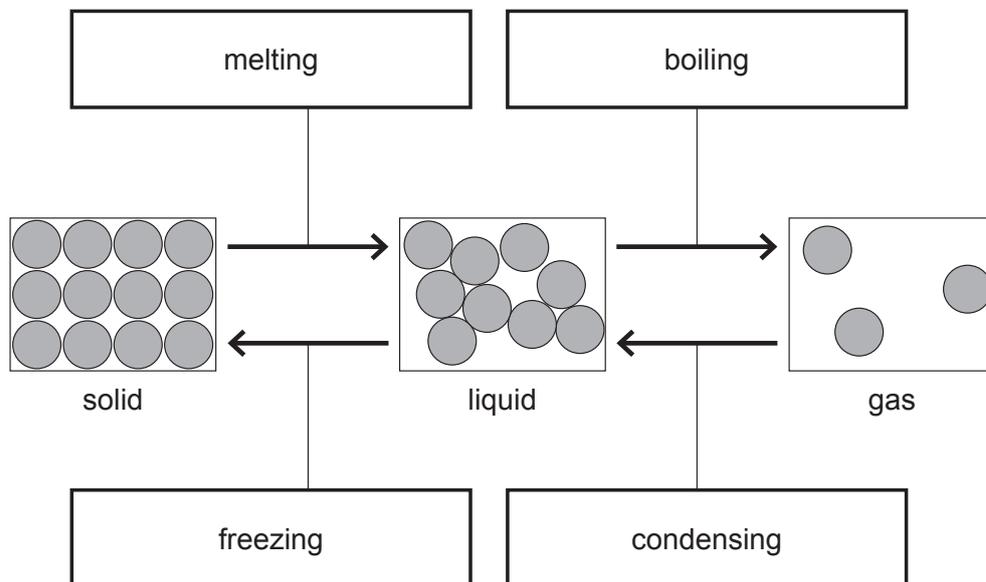
[1]

[1]

[1]

8

3 (a)



All correct = [2], 2–3 correct = [1] [2]

(b) (i) An element contains only one **type** of atom [1]

(ii) Subliming is when a solid turns into a gas (and vice versa) [1]

4 (a) Labelled filter funnel added correctly to the diagram [1]  
labelled filter paper added correctly to the diagram [1] [2]

(b) (i)

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

[1]

(ii) Salt is soluble in water/salt and water will both pass through the filter paper [1]

(iii) Evaporation/crystallisation/distillation [1]

AVAILABLE  
MARKS

4

5

5 (a) A chemical/dye that changes colour [1] when in an acid/alkali [1] [2]

(b) Add water/crush berries [1]  
heat/boil/leave to stand [1]  
remove the berries/use the liquid as the indicator [1] [3]

(c)

Substance	Colour of blueberry indicator
weak acid	purple [1]
strong acid	red [1]
neutral	green

[2]

(d) It is the same colour (in alkali and neutral solutions) they would both turn green [1]

(e) More accurate [1]

AVAILABLE  
MARKS

9

## 6 (a) Indicative Content:

- safety goggles
- safety screen/fume cupboard
- (large) trough of water
- small piece of metal
- use tongs
- two similarities from: vigorous reaction/metal floats/moves on surface/  
metal disappears/gas given off/exothermic
- difference: potassium burns with a **lilac** flame and sodium **orange**/  
potassium is **more** vigorous

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe the reaction of alkali metals with water using <b>six to eight</b> of the points above, in a logical sequence including one similarity and one difference in observations. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates use some appropriate specialist terms to describe the reaction of alkali metals with water using <b>four to five</b> of the points above, in a logical sequence. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates describe the reaction of alkali metals with water using <b>one to three</b> of the above points. However, these are not presented in a logical sequence. They use limited spelling, punctuation and grammar and have made limited use of specialist terms. The form and style are of a limited standard.	[1]–[2]
D	Not worthy of credit.	[0]

[6]

- (b) Sodium hydroxide [1]  
hydrogen [1]

[2]

8

## 7 (a) Order of atomic mass

[1]

- (b) Noble gases [1]  
the Noble gases are unreactive/weren't discovered at the time [1]

[2]

- (c) Copper/zinc/titanium/vanadium/astatine/selenium/chromium/manganese/  
iron/cobolt/nickel/hydrogen

[1]

- (d) 2,8,2 drawn

[1]

5

8 (a)	Reaction	Products formed				AVAILABLE MARKS
		a salt	water	hydrogen	carbon dioxide	
	calcium hydroxide and hydrochloric acid					
	calcium metal and hydrochloric acid	✓		✓		
						[2]
(b)	Exothermic					[1] 3
9 (a)	All points plotted correctly [2] (6 points plotted correctly [1]) correct curve [1]					[3]
(b)	As the <b>time</b> increases, the <b>volume</b> of gas increases [1] at 40 s/48 cm <sup>3</sup> there is no longer any more gas produced [1]					[2]
(c) (i)	Limewater					[1]
(ii)	Colourless [1] to cloudy [1]					[2]
(d) (i)	Four					[1]
(ii)	Six					[1] 10
10 (a)	Any <b>two</b> from: • global warming • sea levels rise/polar ice cap melting • flooding • climate change • or other suitable					[2]
(b) (i)	$  \begin{array}{cccc}  & \text{H} & \text{H} & \text{H} & \text{H} \\  &   &   &   &   \\  \text{H} & - \text{C} & - \text{C} & - \text{C} & - \text{C} - \text{H} \\  &   &   &   &   \\  & \text{H} & \text{H} & \text{H} & \text{H}  \end{array}  $					[1]
(b) (ii)	CH <sub>4</sub> [1] C <sub>3</sub> H <sub>8</sub> [1]					[2] 5
<b>Total</b>						<b>60</b>

