



Rewarding Learning

**General Certificate of Secondary Education
2015–2016**

Science: Single Award

Unit 2 (Chemistry)

Higher Tier

[GSS22]

THURSDAY 12 NOVEMBER 2015, MORNING

**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) As the atomic number of the alkali metal increases the boiling point decreases [1]
- (b) 600–640 °C (any value in the range) [1]
- (c) 1400 – 180 [1]
1220 [1] [2]
- (d) Hydrogen [1]
- (e) Lithium will react less vigorously [1]
- (f) Any **two** from:
use a safety screen/fume cupboard
use tongs
use a small amount of potassium/large amount of water [2]
- (g) (i) 2.8.1 drawn correctly [1]
- (ii) They all have the same number of electrons/1 electron in their outer shell [1]

AVAILABLE
MARKS

10

2 Indicative Content:

- idea of plate tectonics
- volcanoes occur when tectonic plates are pulled apart/pushed together
- pressure builds up (in the magma chamber)
- magma is pushed to the surface
- lava flows out of cracks/down sides of volcano
- produces dust/gas/ash clouds
- lava cools to form igneous rocks
- kills plants and animals in the surrounding areas

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe the process of a volcanic eruption using six to eight of the points above, in a logical sequence including the term plate tectonics. 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 process of a volcanic eruption using four or five 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 process of a volcanic eruption using one, two or three 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]

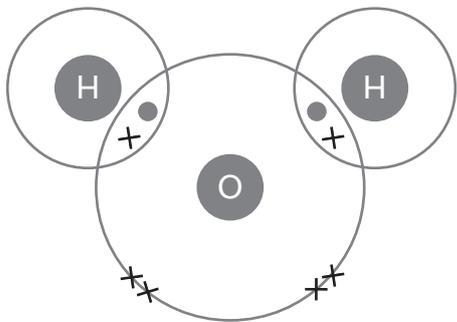
[6]

6

		AVAILABLE MARKS
3	(a) Plasticised PVC and polythene	[1]
	(b) PVC [1] can be coloured [1] hard/keeps its shape/weather resistant/qualified cost [1]	[3]
	(c) Does not keep its shape [1] would not support the weight of a person [1]	[2]
4	(a) Magnesium, zinc, tin, copper (any 2 in correct order [1])	[2]
	(b) (i) Tin sulfate [1] + copper [1] (either order)	[2]
	(ii) Displacement	[1]
	(c) Zinc + copper sulfate – blue solution fades [1] magnesium + acid – bubbles of gas [1]	[2]
5	(a) (i) Phosphorus	[1]
	(ii) B	[1]
	(iii) A and D	[1]
	(iv) 9	[1]
	(v) B	[1]
	(b) Any two from: fire, earth, air, water	[2]
		6
		7
		7

- 6 (a) 4 [1]
- (b) (i) Very little lather/no lather/scum/lots of soap needed for lather [1]
- (ii) Used as a control/to compare results [1]
- (iii) A as it contains the most calcium **and** magnesium ions [1]
- (iv) Use a pH meter/probe [1]
- (c) Strong teeth and bones/prevents heart disease [1]
- (d) Calcium carbonate [1]
- (e) Any **two** from:
precipitation/adding washing soda
distillation
ion exchange [2]

(f)



Correct sharing [1]
correct oxygen electrons [1]
labelled H and O [1]

[3]

12

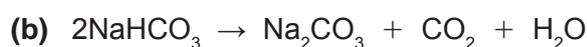
		AVAILABLE MARKS
7	(a) (i) All points correct [2] (three points correct [1]) line of best fit [1]	[3]
	(ii) 3500	[1]
	(b)	
	$ \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H}-\text{C}-\text{C}-\text{H} \\ \quad \\ \text{H} \quad \text{H} \end{array} $	[1]
	(c) $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$ [1] [1]	
	correct balancing [1]	[3]
	(d) (i) C	[1]
	(ii) A [1] it contains oxygen as well as carbon and hydrogen [1]	[2]
		11
	8	
(a) Using electricity [1] to break down a substance [1]	[2]	
(b) Aluminium oxide	[1]	
(c) (i) Cathode	[1]	
(ii) Aluminium ions [1] gain three [1] electrons [1]	[3]	
	7	

9 (a) Indicative Content:

- neutralisation
- sodium hydrogencarbonate is an alkali (base)
- the stomach contains excess acid
- stomach acid is hydrochloric acid
- products are:
 - sodium chloride
 - water and
 - carbon dioxide

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe the neutralisation reaction of sodium hydrogencarbonate using six or seven of the points above, in a logical sequence. 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 theories about the neutralisation reaction of sodium hydrogencarbonate using four or five 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 theories about the neutralisation reaction of sodium hydrogencarbonate using one, two or three 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]



LHS[1]

RHS[1]

Correct balancing [1]

[3]

9

Total**75**AVAILABLE
MARKS