



Rewarding Learning

**General Certificate of Secondary Education
2014–2015**

Science: Single Award

Unit 2 (Chemistry)

Higher Tier

[GSS22]

THURSDAY 13 NOVEMBER 2014, 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.

			AVAILABLE MARKS	
1	(a)	(i) Mg/magnesium	[1]	6
		(ii) Any two : Magnesium/chlorine/argon (accept symbols)	[1]	
		(iii) Lithium/Li	[1]	
		(iv) Chlorine/helium/argon (accept symbols)	[1]	
	(b)	The Halogens	[1]	
	(c)	H in correct position	[1]	
2	(a)	(i) All four bars drawn correctly (three bars drawn correctly award [1])	[2]	
		(ii) C [1] It took the most soap to produce a lather [1]	[2]	
		(iii) Measure out 50 cm ³ of water/measure same volume [1] boil the sample [1] less soap is needed after boiling [1]	[3]	
	(b)	(i) Calcium [1] and magnesium [1] (either order)	[2]	
		(ii) Good for teeth or bones/prevents heart disease	[1]	
	(c)	(i) Calcium carbonate [1] water [1] carbon dioxide [1] (any order)	[3]	
		(ii) It stops kettles working properly/wastes energy	[1]	14

3 Indicative Content:

- A composite material is one that combines the properties of more than one material
- to produce a more useful/new material for a particular purpose
- **Three** from glass fibre is light/glass fibre is easily moulded/car can go faster/car will use less fuel or other suitable
- Composites are expensive [6]

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe composite materials using five or more 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 composite materials using three or four 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 composite materials using one or two 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]

AVAILABLE
MARKS

6

- 4 (a) Magnesium, zinc, lead, copper (any two in correct order [1]) [2]
- (b) Lilac [1]
- (c) Too dangerous/too violent/too reactive [1]
- (d) potassium hydroxide [1]
hydrogen [1] (either order) [2]
- (e) Copper [1]
it does not react with cold or hot water [1] [2]
- (f) The reduction of the size of particles (particles are 1×10^{-9} m) [1]
to produce new properties [1] [2]

10

			AVAILABLE MARKS
5	Pupil: Jane [1] Explanation: electrons do move/orbit the nucleus [1]	[2]	2
6	(a) Methane	[1]	
	(b) CFC	[1]	
	(c) CFC and methane	[1]	
	(d) Contributes to at least 50% of greenhouse effect/most of greenhouse effect [1] reduction would happen quickly/only lasts for 7 years in upper atmosphere [1]	[2]	
	(e) O ₂ [1] H ₂ O [1] Correct balancing [1]	[3]	8
7	(a) B	[1]	
	(b) A [1] it shows an acid and alkali reacting/to produce salt and water [1]	[2]	
	(c) Removal of oxygen/addition of hydrogen	[1]	4
8	(a) propene	[1]	
	(b) $\begin{array}{ccccccc} & \text{H} & \text{H} & \text{H} & & & \\ & & & & & & \\ \text{H} & -\text{C} & -\text{C} & -\text{C} & -\text{H} & & \\ & & & & & & \\ & \text{H} & \text{H} & \text{H} & & & \end{array}$ [1]		
	C ₂ H ₄ [1]		
	Butane [1]	[3]	
	(c) Many small molecules/monomers [1] joining together (in long chains) [1]	[2]	6

		AVAILABLE MARKS
9	(a) (i) Mg: 2.8.2 [1] O: 2.6 [1]	[2]
	(ii) Arrow (s) drawn to indicate: 2 electrons moving [1] from magnesium to oxygen [1]	[2]
	(b) Idea of sharing [1] each hydrogen shares 1 electron [1]	[2]
10	(a) Correct labels for anode [1] and cathode [1]	[2]
	(b) Using electricity [1] to break down/decompose a compound [1]	[2]
	(c) Al ³⁺ [1] 3e [1]	[2]
	(d) Oxygen (accept carbon dioxide)	[1]
		6
		7

11 Indicative Content:

- The Greeks had four elements
- Earth, fire, air and water (any 3 named)
- John Newlands developed the law of octaves
- Each eighth element was similar
- Mendeleev ordered the elements into group and periods/separated metals and non-metals
- Newlands/Mendeleev ordered the elements according to mass number/atomic mass
- Mendeleev left gaps for undiscovered elements
- Modern periodic table is ordered by atomic number/includes more elements/includes noble gases

[6]

Band	Response	Mark
A	Candidates must use appropriate specialist terms throughout to describe the development of the periodic table using six or more 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 development of the periodic table using three – 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 development of the periodic table using one or two 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]

Total

AVAILABLE
MARKS

6

75