



**General Certificate of Secondary Education
2024**

Double Award Science: Chemistry

Unit C2

Foundation Tier

[GDW51]

FRIDAY 14 JUNE, 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) (i)

Observations	Tick (✓)
bubbles of gas	✓ [1]
the reaction is slow throughout	
the metal sinks then rises	✓ [1]
the metal stays on the surface of the water	

[2]

(ii) calcium hydroxide

[1]

(b) (i)

zinc	Most Reactive  Least Reactive
lead	
copper	
silver	

Must have the most and least reactive for [1] all four correct [2]

[2]

(ii) zinc nitrate [1] silver [1]

[2]

(iii) grey solid formed [1] blue solution formed [1]

[2]

(c) (i) $2\text{Ca} + \text{O}_2 \longrightarrow 2\text{CaO}$

[1]

(ii) iron

[1]

11

2 (a) heat is taken in

[1]

(b) reduction

[1]

(c) magnesium [1]

it is gaining oxygen [1]

[2]

(d) Any **two** from:

painting/oiling/plastic coating/metal coating/galvanising
2 × [1]

[2]

6

3	(a) (i) graphite/carbon	[1]	AVAILABLE MARKS
	(ii) oxygen reacts (with the graphite anode) [1] to produce carbon dioxide/burns away [1]	[2]	9
	(iii) (so that the) ions [1] are free to move and carry charge [1]	[2]	
	(iv) cryolite	[1]	
	(v) tapped off/run off/drained off	[1]	
	(b) where oxidation and reduction take place [1] in the same reaction [1]	[2]	
4	(a) (i) hydrocarbon(s)	[1]	12
	(ii) evaporate [1] condense [1] boiling [1]	[3]	
	(iii) <table border="1" data-bbox="296 819 536 873">Petrol</table>	fuel for aircraft [1]	
	<table border="1">Kerosene</table>	fuel for cars	
	<table border="1">Naphtha</table>	manufacturing chemicals [1]	
	<table border="1">Bitumen</table>	to surface roads [1]	
	<table border="1">used for cooking</table>	[3]	
	(b) (i) S	[1]	
	(ii) Q	[1]	
	(iii) gas	[1]	
	(iv) from: yellow/orange [1] to colourless [1]	[2]	

- 5 (a) (i) hydrated [1]
- (ii) 244 [1]
- (b) (i) decomposition [1]
- (ii) evaporating [1]
Bunsen burner [1]
mass [1] [3]
- (iii) decreases [1]
- (iv) BaCl_2 [1] + $2\text{H}_2\text{O}$ [1]
Any order [2]

- 6 (a) (i) 78% [1]
- (ii) coolant [1]
- (iii) triple covalent bond [1]
takes lots of energy to break [1] [2]

(iv)

Statement	True	False
Nitrogen gas is colourless	✓ [1]	
Nitrogen has a pungent odour		✓ [1]
Nitrogen has a low boiling point	✓ [1]	

[3]

(b) Indicative content

Name the solid **X** and the pieces apparatus labelled **Y** and **Z**.

- X = zinc/magnesium
- Y = delivery tube
- Z = gas jar

Describe the test for hydrogen and state the result for the positive test

- Lit splint
- (burns with a) pop

Explain why hydrogen is described as a clean fuel

- only water produced/no carbon dioxide produced
- doesn't cause pollution/global warming/climate change/
greenhouse effect/acid rain/smog

AVAILABLE
MARKS

9

Level of Response		Marking Criteria	Marks	AVAILABLE MARKS
Excellent	Candidate clearly articulates the details of the two industrial processes. There is excellent use of spelling, punctuation and grammar. Form and style are of an excellent standard using 5 or more indicative points.		[5]–[6]	13
Good	Candidate provides a good description of the two industrial processes. There is good use of spelling, punctuation and grammar. Form and style are of a good standard using 3–4 indicative points.		[3]–[4]	
Basic	Candidate provides a limited description of the industrial process. There is limited use of spelling, punctuation and grammar. Form and style are of basic standard. 2 indicative points used.		[1]–[2]	
	Response not worthy of credit		[0]	
			[6]	
(a)	calcium chloride [1] water [1] any order		[2]	
(b)	(electronic) balance		[1]	
(c)	gas escapes from the flask		[1]	
(d)	time = 50 [1] mass = 95 [1]		[2]	
(e)	increase		[1]	
(f)	graph starts at same point [1] steeper curve below original line [1] end at same point [1]		[3]	10
Total				70