New Specification

Rewarding Learning

General Certificate of Secondary Education
2018–2019

Double Award Science: Chemistry

Unit C1

Foundation Tier

[GDW21]

THURSDAY 8 NOVEMBER 2018, 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)**

Solution	Colour with universal indicator
dilute hydrochloric acid	**red** [1]
dilute sodium hydroxide	**dark blue/purple** [1]

[2]

(ii) green [1]

(b) **(i)** 5 [1]

(ii) blue litmus [1]

(c) H^+ [1]

(d) **(i)** → calcium chloride [1] + carbon dioxide [1] [2]

(ii) Any **two** of:
solid disappears/dissolves
colourless solution formed
bubbles/gas given off/effervescence/fizzing
heat released
2 × [1] [2] 10

2 **(a)** Marking points:
- draw a **pencil** line
- near the bottom of the paper
- spot the ink on to line/paper
- place in solvent/water
- idea of 3 spots

4 or 5 points [3]; 3 points = [2]; 2 points = [1] [3]

(b) **(i)** anhydrous [1] copper(II) sulfate [1] [2]

(ii) changes colour from white [1] to blue [1] [2] 7

				AVAILABLE MARKS
3	(a)	it contains only one type of atom [1] or cannot be broken into anything simpler (by chemical means) [1]	[1]	
	(b) (i)	C	[1]	
	(ii)	O	[1]	
	(iii)	Any **one** of: aluminium/iron/sodium	[1]	
	(iv)	iron/Fe	[1]	
	(c) (i)	A	[1]	
	(ii)	C	[1]	
	(iii)	D	[1]	8
4	(a)	Any **two** from: melts/forms a ball disappears/dissolves idea of vigorous reaction **colourless** solution remains **not** moving on surface or floating **not** fizzing or equivalent **not** heat released (Allow yellow or orange flame) Any 2 × [1]	[2]	
	(b) (i)	less than	[1]	
	(ii)	hydrogen	[1]	
	(c)	$2Na + 2H_2O \rightarrow 2NaOH + H_2$ correct formulae of reactants [1] correct formulae of products [1] correct balancing (if all formulae correct) [1]	[3]	
	(d)	oil [1] oxygen [1] air [1]	[3]	10

AVAILABLE MARKS

5 **(a)** **(i)** 66 [1]

(ii) 46 [1]

(b) **(i)**

Atom OR Ion	Atomic number	Mass number	Number of electrons	Electronic configuration
Q	3	**7**	2	2
R	11	23	**11**	2,8,1
S	**17**	37	**17**	2,8,7
T	19	39	18	**2,8,8**
U	14	**28**	14	**2,8,4**
V	**8**	16	10	2,8

[1] per column correct [4]

(ii) Q, T and V all needed
[2] marks for all 3 correct
[1] mark for 2 correct [2] 8
If 4 answers given – 3 correct = [1], 2 correct = [0]

AVAILABLE MARKS

6 Indicative content

Sublimation:
- Grey-black **or** dark grey solid (in bottom of boiling tube)
- **Purple** vapour/gas (rises up boiling tube) (without liquid state)
- Idea that (grey-black **or** dark grey) solid/crystals form on sides of/near top of boiling tube

Fume cupboard:
- Iodine (vapour) is **poisonous/toxic** **not** harmful **not** dangerous

Sublimation reason:
- Forces **between** molecules (in a molecular covalent substance) are weak/van der Waals
- Idea that these weak/van der Waals forces need little energy to break

Band	Response	Mark
A	Candidates must use appropriate scientific terms throughout to describe and explain the sublimation of iodine using **5–6** of the points in the indicative content. They use good spelling, punctuation and grammar and the form and style are of a high standard.	[5]–[6]
B	Candidates use **3–4** points from the indicative content to describe and explain the sublimation of iodine using some scientific terms. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard.	[3]–[4]
C	Candidates use **2** of the points from the indicative content to describe and explain the sublimation of iodine. They use limited spelling, punctuation and grammar and make little use of scientific terms. The form and style are of a limited standard.	[1]–[2]
D	Response not worthy of credit.	[0]

[6] 6

7 (a) (i) 127 [1]

(ii) 116 [1]

(iii) 400 [1]

(b) Idea of (numerically) equal to the relative formula mass [1]

(c) (i) 49.6 g [1]

(ii) 1.5 moles [1] 6

				AVAILABLE MARKS
8	**(a)**	a shared pair of electrons	[1]	
	(b)	correct sharing [1] correct total number of electrons [1] dot and cross [1]	[3]	
	(c)	7	[1]	5
			Total	**60**