Rewarding Learning

General Certificate of Secondary Education
2012–2013

# Double Award Science: Chemistry

Unit C1

Foundation Tier

**[GSD21]**

**TUESDAY 26 FEBRUARY 2013**
**9.30 am–10.30 am**

# 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** | Making flares – Mg [1]<br>pencil lead – C [1]<br>electrical cables – Al [1]<br>unreactive gas – Ar [1]<br>bridges – Fe [1] | [5] | 5 |
| **2** | **(a)** E | [1] | |
| | **(b)** **(i)** C | [1] | |
| | **(ii)** oil any suitable | [1] | |
| | **(c)** A | [1] | |
| | **(d)** D [1] E [1] | [2] | 6 |
| **3** | **(a)** **(i)** alloys | [1] | |
| | **(ii)** hard wearing/durable/long lasting<br>malleable<br>unreactive/inert<br>hard<br>**(any 2 × [1])** | [2] | |
| | **(b)** **(i)** 20% | [1] | |
| | **(ii)** 2p coin | [1] | |
| | **(iii)** 2.50 [1] – 1.70 [1]<br>0.8 [1]<br>apply c.m. for 3rd mark | [3] | 8 |
| **4** | **(a)** 2 | [1] | |
| | **(b)** oxygen | [1] | |
| | **(c)** 2,8,1 | [1] | |
| | **(d)** Idea that it has equal numbers of protons and electrons | [1] | |
| | **(e)** total number of protons and neutrons (in an atom) | [1] | |
| | **(f)** isotopes | [1] | 6 |

| | | | | | AVAILABLE MARKS |
|---|---|---|---|---|---|
| **5** | **(a)** | **(i)** | D | [1] | |
| | | **(ii)** | bromine | [1] | |
| | **(b)** | | B | [1] | |
| | **(c)** | | floats on surface [1]<br>gives off gas/fizzes [1]<br>moves [1] idea of vigorous reaction [1]<br>disappears completely [1]<br>colourless solution remains [1]<br>do **not** accept goes on fire<br>or forms a ball any 4 | [4] | |
| | **(d)** | | lithium hydroxide [1] + hydrogen [1] | [2] | 9 |
| **6** | **(a)** | **(i)** | Idea that it only has two colours/it can <u>only</u> indicate an alkali | [1] | |
| | | **(ii)** | It has different colours [1] for acid, alkali (and neutral) [1] | [2] | |
| | | **(iii)** | It can indicate the strength of the acid/it can indicate the pH | [1] | |
| | **(b)** | | Gives a (more) accurate reading | [1] | |
| | **(c)** | | sulfuric acid [1] water [1] carbon dioxide [1] | [3] | |
| | **(d)** | **(i)** | $CuSO_4$<br>It is white [1] and will change to blue [1] when water is added | [1]<br>[2] | |
| | | **(ii)** | anhydrous | [1] | 12 |
| **7** | **(a)** | | 2,8,8,1 [1] 2,7 [1] | [2] | |
| | **(b)** | | potassium loses one electron [1]<br>fluorine gains one electron [1]<br>$K^+$ [1] $F^-$ [1] | [4] | |
| | **(c)** | | electrostatic attraction/attraction between oppositely charged ions | [1] | |
| | **(d)** | | KF | [1] | 8 |

| AVAILABLE MARKS |
|---|

**8** **(a)** mass of solid [1] required to saturate [1]
100 g of water [1] at a particular temperature [1] [4]

**(b)** **Indicative content**

- Allow to cool
- Note appearance of crystals
- Record temperature at which they form
- Add another small given volume of water
- Idea of repeating stage 3
- Idea of repeat until a set of results are obtained
- Idea of carrying out appropriate calculations

| Response | Mark |
|---|---|
| Candidates must use appropriate scientific terms throughout to describe the experimental procedure, using 5 to 7 of the points in the indicative content, in a logical sequence. They use good spelling, punctuation and grammar and the form and style are of a high standard. | [5–6] |
| Candidates use 3 or 4 points from the indicative content to describe the experimental procedure in a logical sequence using some scientific terms. They use satisfactory spelling, punctuation and grammar and the form and style are of a satisfactory standard. | [3–4] |
| Candidates use 1 or 2 of the points from the indicative content to describe the experimental procedure. However these are not presented in a logical sequence. 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] |
| Response not worthy of credit. | [0] |

[6]

**(c)** 100/12 [1] 100/12 × 2 [1] = 16.7 [1] [3]

**(d)** **(i)** The solubility of potassium chlorate rises [1] as the temperature increases [1] [2]

**(ii)** 30 (g/100 g water) [allow 30–30.5] [1] 16

**Total** **70**