



# **General Certificate of Secondary Education**

## **Science B 4462 / Chemistry 4421**

**CHY1F            Unit Chemistry 1**

# **Mark Scheme**

*2010 Examination – June Series*

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this Mark Scheme are available to download from the AQA Website: [www.aqa.org.uk](http://www.aqa.org.uk)

Copyright © 2010 AQA and its licensors. All rights reserved.

#### COPYRIGHT

AQA retains the copyright on all its publications. However, registered centres for AQA are permitted to copy material from this booklet for their own internal use, with the following important exception: AQA cannot give permission to centres to photocopy any material that is acknowledged to a third party even for internal use within the centre.

Set and published by the Assessment and Qualifications Alliance.

---

## Marking Guidance for Examiners

### GCSE Science Papers

#### 1. General

The mark scheme for each question shows:

- the marks available for each part of the question
- the total marks available for the question
- the typical answer or answers which are expected
- extra information to help the Examiner make his or her judgement and help to delineate what is acceptable or not worthy of credit or, in discursive answers, to give an overview of the area in which a mark or marks may be awarded.

The extra information is aligned to the appropriate answer in the left-hand part of the mark scheme and should only be applied to that item in the mark scheme.

At the beginning of a part of a question a reminder may be given, for example:

where consequential marking needs to be considered in a calculation;

or the answer may be on the diagram or at a different place on the script.

In general the right hand side of the mark scheme is there to provide those extra details which confuse the main part of the mark scheme yet may be helpful in ensuring that marking is straightforward and consistent.

#### 2. Boldening

- 2.1** In a list of acceptable answers where more than one mark is available ‘any **two** from’ is used, with the number of marks boldened. Each of the following lines is a potential mark.
- 2.2** A bold **and** is used to indicate that both parts of the answer are required to award the mark.
- 2.3** Alternative answers acceptable for a mark are indicated by the use of **or**. (Different terms in the mark scheme are shown by a / ; eg allow smooth / free movement.)

#### 3. Marking points

##### 3.1 Marking of lists

This applies to questions requiring a set number of responses, but for which candidates have provided extra responses. The general principle to be followed in such a situation is that ‘right + wrong = wrong’.

Each error/contradiction negates each correct response. So, if the number of error/contradictions equals or exceeds the number of marks available for the question, no marks can be awarded.

However, responses considered to be neutral (indicated as \* in example 1) are not penalised.

Example 1: What is the pH of an acidic solution? (1 mark)

Candidate	Response	Marks awarded
1	4,8	0
2	green, 5	0
3	red*, 5	1
4	red*, 8	0

Example 2: Name two planets in the solar system. (2 marks)

Candidate	Response	Marks awarded
1	Pluto, Mars, Moon	1
2	Pluto, Sun, Mars, Moon	0

### 3.2 Use of chemical symbols / formulae

If a candidate writes a chemical symbol / formula instead of a required chemical name, full credit can be given if the symbol / formula is correct and if, in the context of the question, such action is appropriate.

### 3.3 Marking procedure for calculations

Full marks can be given for a correct numerical answer, as shown in the column 'answers', without any working shown.

However if the answer is incorrect, mark(s) can be gained by correct substitution / working and this is shown in the 'extra information' column;

### 3.4 Interpretation of 'it'

Answers using the word 'it' should be given credit only if it is clear that the 'it' refers to the correct subject.

### 3.5 Errors carried forward

Any error in the answers to a structured question should be penalised once only.

Papers should be constructed in such a way that the number of times errors can be carried forward are kept to a minimum. Allowances for errors carried forward are most likely to be restricted to calculation questions and should be shown by the abbreviation e.c.f. in the marking scheme.

### 3.6 Phonetic spelling

The phonetic spelling of correct scientific terminology should be credited **unless** there is a possible confusion with another technical term.

### 3.7 Brackets

(.....) are used to indicate information which is not essential for the mark to be awarded but is included to help the examiner identify the sense of the answer required.

**CHY1F****Question 1**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
1(a)	building		1
1(b)	provides jobs		1
1(c)	any <b>two</b> from: <ul style="list-style-type: none"> <li>• noise</li> <li>• dust / visual pollution</li> <li>• air / atmospheric</li> <li>• exhaust gases</li> <li>• (more) traffic</li> </ul>	ignore references to water allow sound pollution accept global dimming ignore smoke  accept acid rain / global warming / named gaseous pollutants  accept <u>more</u> lorries	2
1(d)	O  3 / three	ignore any numbers	1  1
1(e)	calcium oxide	accept quicklime  do <b>not</b> accept calcium dioxide	1
<b>Total</b>			<b>7</b>

**CHY1F****Question 2**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>2(a)</b>	alloys		<b>1</b>
<b>2(b)</b>	bar drawn correctly up to 4%	ignore width of bar	<b>1</b>
<b>2(c)</b>	(contains) <u>more</u> carbon	ignore contains 4% carbon  accept higher level responses related to structure / arrangement of atoms	<b>1</b>
<b>2(d)(i)</b>	73.8		<b>1</b>
<b>2(d)(ii)</b>	mild (steel)		<b>1</b>
<b>2(d)(iii)</b>	corrosion		<b>1</b>
<b>Total</b>			<b>6</b>

**CHY1F****Question 3**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>3(a)</b>	acid rain → sulfur dioxide		1
	global warming → carbon dioxide		1
	global dimming → carbon particles		1
<b>3(b)(i)</b>	oxygen		1
<b>3(b)(ii)</b>	carbon monoxide		1
<b>3(c)(i)</b>	decreasing	accept running out / none left	1
<b>3(c)(ii)</b>	any <b>two</b> from: <ul style="list-style-type: none"> <li>• world needs (more) energy</li> <li>• plentiful supply</li> <li>• (many) countries have coal</li> <li>• easy to find / extract</li> <li>• oil / gas is running out</li> <li>• cheap <b>or</b> cheaper than oil</li> </ul>	it = coal accept population is increasing allow (greater) demand for coal / fuels / energy  accept readily available allow coal will 'last longer'  accept need to use less oil / gas accept need to use it to replace oil / gas	2
<b>Total</b>			<b>8</b>

## CHY1F

## Question 4

question	answers	extra information	mark
4(a)(i)	2 / two		1
4(a)(ii)	E104 spots are at the same level / match	independent mark	1 1
4(b)(i)	to <u>improve</u> / <u>enhance</u> the colour / <u>change</u> the colour	ignore sell more drinks allow to improve appearance do <b>not</b> accept preservative / emulsifier / improve taste / make it fizzy	1
4(b)(ii)	any <b>one</b> from: <ul style="list-style-type: none"> <li>• (artificial) flavourings</li> <li>• carbon dioxide</li> <li>• preservatives</li> <li>• plastic (bottle / cap)</li> </ul>	accept sugar / saccharine / glucose / sweetener / caffeine  ignore other additives / tartrazine / quinoline yellow / sunset yellow	1
4(c)(i)	monomers polymers		1 1

Question 4 Continues on the next page



**CHY1F****Question 4 continued**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>4(c)(ii)</b>	any <b>two</b> from: <ul style="list-style-type: none"> <li>• not enough space</li> <li>• not biodegradable</li> <li>• waste of resource / crude oil</li> <li>• could be recycled</li> <li>• can burn as a fuel to provide energy</li> </ul>	ignore litter / global warming / animals / habitats accept not enough landfills <b>or</b> landfills are full / filling up  allow crude oil is running out  ignore reuse	<b>2</b>
<b>Total</b>			<b>9</b>

## CHY1F

## Question 5

question	answers	extra information	mark
5(a)(i)	A and 3	accept A and 39	1
	anomalous result	independent mark accept not close to other two volumes <b>or</b> correct comparison using the results  ignore does not fit the pattern	1
5(a)(ii)	any <b>one</b> from: <ul style="list-style-type: none"> <li>• volume of water (used)</li> <li>• time (for water to run through)</li> <li>• temperature</li> <li>• mass / surface area of pad</li> <li>• same filter funnel</li> </ul>	allow amount of water (used)  accept rate / speed (at which water runs through)  accept amount / size / volume / thickness of pad  ignore other equipment	1
5(a)(iii)	any <b>one</b> from: <ul style="list-style-type: none"> <li>• incorrect / volume / amount of water added</li> <li>• reading / volume / amount of water collected</li> <li>• some water does not go through the pad</li> <li>• not enough time allowed for water to drain through</li> <li>• pads (from one company) not identical / faulty</li> </ul>	ignore human error unqualified  allow spillage / poorly placed pad  accept rate / speed at which water is added	1

Question 5 Continues on the next page

**CHY1F****Question 5 continued**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
<b>5(b)(i)</b>	any <b>two</b> from: <ul style="list-style-type: none"> <li>• it was not the best (at absorbing the water)</li> <li>• (needed) to absorb more (water)</li> <li>• to improve their image / sales</li> </ul>	accept correct descriptions of 'not the best' / third best <b>or</b> only better than B  allow not absorbing enough (water)  accept (needs) to absorb more (water) than A and C for <b>2</b> marks	<b>2</b>
<b>5(b)(ii)</b>	any <b>one</b> from: <ul style="list-style-type: none"> <li>• cost (more)</li> <li>• use (more) resources</li> <li>• use (more) energy</li> </ul>	must relate to the company	<b>1</b>
<b>Total</b>			<b>7</b>

## CHY1F

## Question 6

question	answers	extra information	mark
6(a)(i)	condensed	it = water vapour  accept temperature went <u>below</u> 100°C / boiling point of water allow <u>cooled to form liquid</u> / water / rain do <b>not</b> accept evaporated	1
	formed the oceans / seas	ignore rain accept (water vapour) cooled and formed the ocean / sea for <b>2</b> marks	1
6(a)(ii)	any <b>two</b> from: <ul style="list-style-type: none"> <li>• <u>used by</u> (green) plants / <i>algae</i></li> <li>• <u>changed into</u> oxygen</li> <li>• dissolved in oceans / seas</li> <li>• (locked up) in carbonates / sedimentary rocks</li> <li>• (locked up) in fossil fuels / named fossil fuel</li> </ul>	ignore oxygen / nitrogen increased ignore reference to volcanoes / respiration  accept photosynthesis / plants give out oxygen  accept (locked up) in shells / skeletons (of animals)	2
6(b)(i)	cannot get to / reach / drill to / see the core	accept the core is (too) far down (into the Earth) / do not know what happens under the crust / Earth's surface  accept it is (too) hot / radioactive ignore lack of evidence unqualified	1
6(b)(ii)	any <b>three</b> from: <ul style="list-style-type: none"> <li>• heat / <u>energy released</u></li> <li>• from radioactive decay / processes</li> <li>• (causing) convection currents</li> <li>• in the mantle</li> </ul>	accept radioactivity / nuclear reactions	3
<b>Total</b>			<b>8</b>

