AQA Level 1/2 Certificate in Science: Double Award

CHEMISTRY PAPER 2H

SPECIMEN MARK SCHEME

MARK SCHEME

Information to Examiners

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. Emboldening

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 emboldened. 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.

COMPONENT NUMBER: AQA Level 1/2 Certificate in Science: Double Award

COMPONENT NAME: Chemistry Paper 2H

STATUS: Accredited

question	answers	extra information	mark
1(a)(i)	protons and neutrons in nucleus 17 protons 18 neutrons electrons orbit nucleus / electronic configuration is 2.8.7		1 1 1 1
1(a)(ii)	isotopes		1
1(b)	the (strong) covalent bonds are not broken when it boils, the weak forces <u>between</u> molecules are overcome		1 1 1
1(c)	division of masses by A_r values correct answers of division simplification by division by smallest correct formula ($NaClO_3$)	correct answer alone with or without working gains **4** marks	1 1 1 1
Total			**12**

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question	answers	extra information	mark
2 (a)	samples will wash off paper **or** samples will dissolve into water from paper		1
2(b)(i)	copper(II) and iron(III)		1
2(b)(ii)	orange / brown	accept rusty	1
2(b)(iii)	$Fe(OH)_3$	accept formula of complex $[Fe(H_2O)_3(OH)_3]$ or any other formula for hydrated iron oxide, such as $Fe_2O_3.9H_2O$	1
2(c)(i)	spot distance 2.1 and solvent front distance 5.1 2.1 / 5.1 = 0.41	correct measurements (allow ± 0.1cm) correct division do **not** accept units given in answer for R_f	1 1
2(c)(ii)	by comparing the value obtained with those in a data book		1
2(d)	Al^{3+} ions are colourless **or** aluminium hydroxide is white which is the same colour as the paper **or** so would not show up on the paper		1 1
Total			**9**

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question	answers	extra information	mark
3(a)	sulfur / S		1
3(b)(i)	any **two** from: • too much water was added **or** water left in flask when rinsed out • too little thiosulfate was added • the temperature was lower than recorded • stopwatch started too soon **or** stopwatch stopped too late		2
3(b)(ii)	less subjective / always time to exactly same point		1
3(b)(iii)	20 (seconds)		1
3(b)(iv)	0.05	allow ecf from 3(b)(iii)	1
3(b)(v)	increases	accept gets faster ignore “the time gets shorter”	1
3(c)(i)	shorter time so bigger percentage error in measuring time **or** reaction is quicker at higher temperatures so it is harder to stop the clock at the right time	accept heat loss so temperature changes during the experiment	1
3(c)(ii)	use more dilute solutions because this would make the reaction slower **or** longer time **or** use a light sensor (1) which eliminates human error **or** times can be read off a graph (1)	accept insulate because it reduces heat loss explanation must match suggested change	1 1

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question	answers	extra information	mark
3(d)(i)	because greater depth (of cloudiness)		1
3(d)(ii)	there would be no change because (she is) looking through same amount of liquid		1 1
Total			**13**

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question	answers	extra information	mark
4(a)(i)	heat catalyst **or** steam very high temperature		1 1
4(a)(ii)	correct structure continuation bonds $(\ )_n$ around structure		1 1 1
4(a)(iii)	start: both orange end poly(propene): orange end propene: colourless		1 1 1
4(a)(iv)	because propene has double bond and poly(propene) does not **or** because only propene has a double bond	accept propene is unsaturated but poly(propene) is saturated **or** only propene is unsaturated	1
4(b)	cornstarch is biodegradable / broken down by microorganisms		1
4(c)	idea of warming / heating by a suitable method the polymer does not become soft / bend		1 1 1
Total			**13**

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question	answers	extra information	mark
5(a)	(bubble through / shake with) limewater (turns) cloudy / milky		1 1
5(b)(i)	apparatus allows gas to be collected, eg gas syringe properly connected graduations marked on collection vessel		1 1
5(b)(ii)	the volume stays constant **or** does not change **or** at 96 cm^3 after 5 minutes		1
5(c)(i)	because the final gas volume is the same		1
5(c)(ii)	she did not heat it as strongly		1
5(d)(i)	 moles $NaHCO_3$ = 1.64/84 = 0.02 moles Na_2CO_3 = 0.02/2 = 0.01 $M_r Na_2CO_3$ = 106 mass Na_2CO_3 = 106 x 0.01 = 1.06 g	at all stages allow ecf from previous stage	 1 1 1 1
5(d)(ii)	solid not fully decomposed reheat it – mass will decrease **or** impurities are present that do not decompose on heating reheat it – mass will stay constant		1 1
Total			**13**