



Mark Scheme

Sample Assessment Material 2018

**Pearson Edexcel International GCSE
in Science (Single Award) (4SS0)
Paper 1C**

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Subject specific marking guidance

Symbols, terms used in the mark scheme

- Round brackets (): words inside round brackets are to aid understanding of the marking point but are not required to award the point
- Curly brackets { }: indicate the beginning and end of a list of alternatives (separated by obliques), where necessary, to avoid confusion
- Oblique /: words or phrases separated by an oblique are alternatives to each other and either answer should receive full credit.
- ecf: indicates error carried forward which means that a wrong answer given in an early part of a question is used correctly to a later part of a question.

You will not see 'owtte' (or words to that effect). Alternative correct wording should be credited in every answer unless the mark scheme has specified specific.

The Additional Guidance column is used for extra guidance to clarify any points in the mark scheme. It may be used to indicate:

- what will not be accepted for that marking point in which case the phrase 'do not accept' will be alongside the relevant marking point
- it might have examples of possible acceptable answers which will be adjacent to that marking point

Question number	Answer	Additional Guidance	Marks
1 (a)	M1 (X) melting M2 (Y) boiling M3 (Z) freezing		3
(b)	A (the particles vibrate about their fixed positions)		1
(c)	D (solid to gas)		1
(d) (i)	endothermic		1
(ii)	$\text{H}_2\text{O(s)} \rightarrow \text{H}_2\text{O(l)}$		1

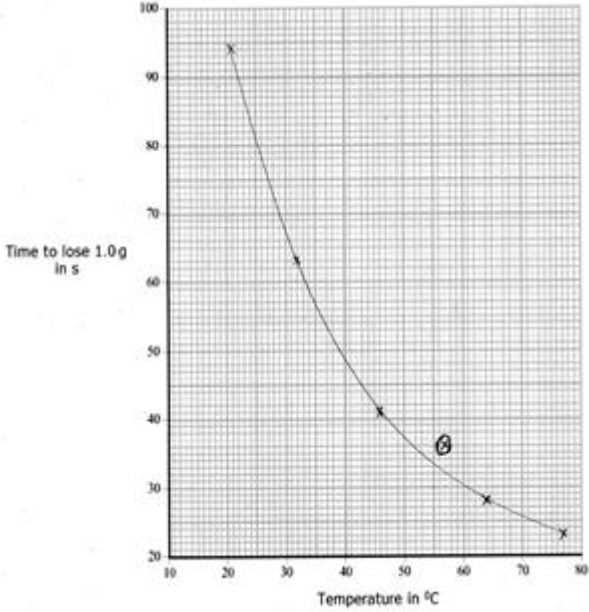
Total for Question 1 = 7 marks

Question number	Answer	Additional guidance	Marks
2 (a)	M1 NH ₄ ⁺ M2 Cl ⁻	ACCEPT answers in either order	2
(b)	M1 moist/damp red litmus M2 turns blue	ACCEPT pH/UI paper ACCEPT blue/indigo/violet/purple if pH/UI paper used	2
(c) (i)	An explanation that links together the following two points: M1 ammonia diffuses more quickly M2 because it has travelled further (along the tube in the same time)	ACCEPT reverse argument for hydrogen chloride	2
(ii)	it is corrosive / it burns / it damages the skin / it damages the eyes	IGNORE irritant / harmful / toxic / poisonous	1
(iii)	wear eye protection e.g. goggles or mask / wear gloves	ACCEPT use tongs if reference made to handling the cotton wool IGNORE references to wearing a lab coat.	1
(d) (i)	M1 add universal indicator to the solution M2 match the colour obtained to a pH chart		2
(ii)	any value between 4 and 6 inclusive		1

Total for Question 2 = 11 marks

Question number	Answer	Additional guidance	Marks
3 (a)	M1 hydrogen M2 carbon	ACCEPT answers in either order	2
(b) (i)	bitumen		1
(ii)	bitumen		1
(c)	M1 (kerosene) aircraft fuel / fuel for central heating / fuel for small heaters and lamps M2 (fuel oil) fuel for ships / industrial heating oil / fuel for power stations / lubrication		2
(d) (i)	a substance that releases thermal energy/heat energy when burned		1
(ii)	M1 water (vapour) M2 carbon dioxide	ACCEPT answers in either order	1 1
(iii)	An explanation that links the following two points: M1 carbon monoxide is produced/a poisonous gas is produced M2 which reduces the capacity of the blood to carry oxygen	ACCEPT toxic gas	2

Total for Question 3 = 11 marks

Question number	Answer	Additional guidance	Marks
4 (a) (i)	 <p>(ii) circle drawn around point (57,36)</p> <p>(iii) suitable curve of best fit drawn for points plotted</p> <p>(iv) Any one from:</p> <ul style="list-style-type: none"> • the marble chips had a smaller surface area • the temperature of acid was lower than 57 °C • the acid used had a lower concentration 	All points plotted correctly to nearest gridline	1
(b)	<p>M1 vertical line drawn to curve at 40°C</p> <p>M2 value read correctly to nearest gridline</p>	Expected value 48-49 s	2

Question number	Answer	Additional guidance	Marks
(c)	<p>M1 1.0 ÷ M2 from (b)</p> <p>M2 numerical value for rate correctly evaluated</p> <p>M3 (unit) g/s</p>	<p>Example calculation: $1.0 \div 48 = 0.021$ ACCEPT any number of sig figs except 1, e.g. 0.02083</p> <p>ACCEPT g s⁻¹</p>	3
(d)	rate increases as temperature increases	<p>ACCEPT reverse argument</p> <p>REJECT directly proportional/ proportional</p>	1
(e)	<p>An explanation that links the following two points:</p> <p>M1 it reduces the loss of thermal/heat energy</p> <p>M2 and therefore the liquid stays at the correct temperature</p>		2

Total for Question 4 = 12 marks

Question number	Answer	Additional guidance	Marks
5 (a)	Any value between 40 and 110 °C	Correct value is 59 °C	1
(b)	M1 (state) solid M2 (colour) black	ACCEPT very dark grey	2
(c) (i)	$\text{H}_2 + \text{Cl}_2 \rightarrow 2 \text{HCl}$		1
(ii)	any value between 0 and 3		1
(iii)	neutralisation		1
(d)	An explanation that links the following points: M1 the (electrostatic) forces (of attraction) between the (oppositely charged) ions in NaCl M2 are much stronger than M3 the intermolecular forces (of attraction) in HCl M4 and therefore more energy is required to overcome (the forces of attraction between the ions in NaCl	ACCEPT ionic bonding	4

Total for Question 5 = 10 marks

Question number	Answer	Additional guidance	Marks
6 (a)	the molecule contains a (carbon to carbon) double bond		1
(b)	<p>M1 no change (in colour) with compound A</p> <p>M2 bromine water is decolourised with compound F</p>	<p>ACCEPT turns colourless</p> <p>IGNORE clear</p>	2
(c)	<p>M1 has no double bond/is saturated</p> <p>M2 formula is C₄H₁₀ which fits the general formula of an alkane C_nH_{2n+2}</p>		2
(d)	C		1
(e)	<p>An explanation that links the following points:</p> <ul style="list-style-type: none"> • addition polymers are non-biodegradable • so landfill sites get filled up • burning produces poisonous/toxic gases 		3

Total for Question 6 = 9 marks

