



# Cambridge Pre-U

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**CHEMISTRY**

**9791/04**

Paper 4 Practical

**For examination from 2020**

MARK SCHEME

Maximum Mark: 40

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**Specimen**

This specimen paper has been updated for assessments from 2020. The specimen questions and mark schemes remain the same. The layout and wording of the front covers have been updated to reflect the new Cambridge International branding and to make instructions clearer for candidates.

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This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 3 Pre-U Certificate.

This document has **4** pages. Blank pages are indicated.

**Generic Marking Principles**

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

**GENERIC MARKING PRINCIPLE 1:**

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

**GENERIC MARKING PRINCIPLE 2:**

Marks awarded are always **whole marks** (not half marks, or other fractions).

**GENERIC MARKING PRINCIPLE 3:**

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

**GENERIC MARKING PRINCIPLE 4:**

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

**GENERIC MARKING PRINCIPLE 5:**

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

**GENERIC MARKING PRINCIPLE 6:**

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Question	Answer	Marks
1(a)	correct working for volume of $\text{H}_2\text{SO}_4$	1
1(b)	adds a volume of acid between 2.00 and 4.00 $\text{cm}^3$ (1) total volume to be greater than 10.00 $\text{cm}^3$ beyond their calculated end-point (1)	2
1(c)	columns labelled as volume, temperature and $\Delta T$ (1) all volumes recorded to 0.05 $\text{cm}^3$ (1) all temperatures recorded to 0.5 $^\circ\text{C}$ (1) volume at which candidate records maximum $\Delta T$ lies within 5.00 $\text{cm}^3$ of volume at which supervisor records maximum $\Delta T$ (1) candidate's maximum $\Delta T$ lies within 2.0 $^\circ\text{C}$ of volume at which supervisor's maximum $\Delta T$ (2) (Award 1 mark if $2.0 < \Delta \leq 4.0$ $^\circ\text{C}$ )	6
1(d)	$\Delta T$ plotted on y-axis, volume on the x-axis, correctly labelled with appropriate units (1) scales chosen to use more than half of each axis (1) all points plotted correctly, fine cross or encircled dot within $\frac{1}{2}$ small square and within the correct square (1) two smooth intersecting curves drawn (1)	4
1(e)(i)	reads the volume of $\text{H}_2\text{SO}_4$ correctly from the intercept of their lines	1
1(e)(ii)	shows working in the calculation (1) correct answer given to 3–4 sf (1)	2
1(f)	first part of the hypothesis is not supported as the graph is a smooth curve (1) second part is supported as temperature falls after the end-point (1)	2
1(g)	uses nearest added volume to the end-point (1) calculates 0.10 as a % of the nearest volume (1)	2
1(h)	notes that heat loss is greater at higher temperatures (1) same amount of heat is now heating a larger volume (1)	2
1(i)	correct answer from use of $\Delta T \times 4.2 \times \text{volume}$	1

Question	Answer	Marks
2(a)	draws up a clear table of results (1) <b>FA 5</b> gives a green ppt with hydroxide which turns brown in contact with air (1) warming with hydroxide evolves a gas which turns damp red litmus paper blue (1) appropriate test for acid (carbonate etc.) with results (effervescence) (1) <b>FA 5</b> contains $\text{NH}_4^+$ (1) <b>FA 5</b> contains $\text{Fe}^{3+}$ (1) <b>FA 5</b> contains $\text{H}^+$ (1)	7
2(b)(i)	$\text{Ba}^{2+}(\text{aq})$ followed by appropriate dilute named acid	1
2(b)(ii)	white ppt (1) insoluble in added acid (1) <b>FA 5</b> contains sulfate (1)	3
2(b)(iii)	oxidation of sulfite to sulfate has taken place so analyse solution as soon as made up	1

Question	Answer	Marks
2(c)(i)	solution turns yellow on adding peroxide (1) on adding hydroxide get a red-brown ppt (1) re-lights a glowing splint (1)	<b>3</b>
2(c)(ii)	oxidation of $\text{Fe}^{2+}$ to $\text{Fe}^{3+}$ (1) decomposition of $\text{H}_2\text{O}_2$ (1)	<b>2</b>