



Cambridge International Examinations
Cambridge Pre-U Certificate

CHEMISTRY

9791/04

Paper 4 Practical

May/June 2016

MARK SCHEME

Maximum Mark: 40

Published

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Mark schemes will use these abbreviations:

;	separates marking points
/	alternatives
ORA	or reverse argument
ALLOW	for a non-ideal but allowable alternative valid point
NOT	answer is not credited
<u>underline</u>	actual word underlined must be used by candidate (grammatical variants excepted)
(xxx)	wording in brackets is for the clarity of the mark scheme but is not required
max	indicates the maximum number of marks that can be given
+	or AND statements on both sides of the + or AND are needed for that mark
ECF	error carried forward
IGNORE	for an answer that is not creditworthy but does not invalidate any additional creditworthy response

Page 3	Mark Scheme	Syllabus	Paper
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Question	Expected Answer	Mark
1(a)	I All 6 masses recorded (1) II All 4 measured masses have appropriate headings and units: /g or (g) or g by each entry (1) III All 4 measured masses to the same number of dp (at least 2 dp) (1) IV Calculates correctly mass of FA 1 added and mass of CO ₂ evolved (1) V and VI Compare corrected mass of FA 1 /corrected mass of CO ₂ with supervisor value. Award V and VI if $\delta \leq 0.20$ (2) OR Award V $0.20 < \delta \leq 0.40$ (1)	6
1(b)(i)	Calculates correctly the moles of CO ₂ (min of 2 sf) (1)	4
1(b)(ii)	Calculates correctly ans (i) $\times 84.3$ (1)	
1(b)(iii)	Shows use of ans (ii) / mass of FA 1 $\times 100$ (1)	
1(b)(iv)	The other components do no liberate a gas on reaction with acid (1) Do not allow other components do not react with acid	
1(c)(i)	There was not enough acid to react with all the magnesium carbonate (1)	2
1(c)(ii)	No, as the mass of the acid is measured (1)	

Page 4	Mark Scheme	Syllabus	Paper
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Question	Expected Answer	Mark
2(a)	I Tabulates initial burette readings, final burette readings and volume of FA 3 added (1) II Appropriate headings and units for titration results (1) III All accurate burette readings and the volumes of FA 3 added are given to the nearest 0.05 cm³ (1) IV Two or more uncorrected accurate titres within 0.20 cm³ (1) V and VI Examiner calculates $\delta = [\text{supervisor value} - \text{corrected mean titre}]$ Award V and VI if $\delta \leq 0.20$ (2) OR Award V only if $0.20 \leq \delta \leq 0.40$ (1)	6
2(b)	Selects titres within 0.20 cm ³ , calculates the correct mean and gives answer to the same number of dp as the most precise burette reading (1)	1
2(c)(i),(ii),(iv)	2.5×10^{-3} given as the answer to both (i) and (ii) AND 0.500 given as answer to (iv) (1)	5
2(c)(iii)	Shows use of ans (ii) / value (b) $\times 1000$ (1)	
2(c)(v),(vi)	Calculates correctly 1(b)(iii) / 100×18 AND Calculates correctly $2 \times \text{ans (v)} / 84.3$ (1)	
2(c)(vii)	Calculates correctly ans (iv) – ans (iii) – ans (vi) (1)	
2(c)(viii)	Calculates correctly ans (vii) / $2 \times 58.3 / 18 \times 100$ (1)	

Page 5	Mark Scheme	Syllabus	Paper
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Question	Expected Answer	Mark
	FA 5 is NaNO_2 FA 6 is KI FA 7 is CuSO_4	
3(a)(i)	Fizzing and brown gas (1)	4
3(a)(ii)	Decolourises (1)	
3(a)(iii)	Yellow / red / brown (solution) formed on adding drop of acid (1)	
3(a)(iii)	Turns blue-black on adding starch (1)	
3(a)(iv)	Uses NaOH/Al and warm (1) Gas evolved turns damp red litmus blue (1)	2
3(a)(v)	Uses silver nitrate (1) Yellow ppt (1)	2
3(a)(vi)	FA 5 is NO_2^- (1) FA 6 is I^- (1)	2
3(b)(i)	Blue ppt (1)	4
3(b)(i)	Dissolves in excess to give a dark blue solution (1)	
3(b)(ii)	Green solution (1)	
3(b)(ii)	Turns to blue solution (1)	
3(b)(iii)	Cu^{2+} (1)	1
3(b)(iv)	Nitrite acts as a ligand, adding acid destroys nitrite ion (1)	1