

Cambridge Assessment International Education

Cambridge International Advanced Subsidiary and Advanced Level

CHEMISTRY 9701/52

Paper 5 Planning, Analysis and Evaluation

March 2019

MARK SCHEME
Maximum Mark: 30

Published

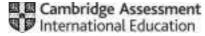
This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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This document consists of 6 printed pages.



Cambridge International AS/A Level – Mark Scheme March 2019

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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.

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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.

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Question	Answer	Marks
1(a)(i)	M1 moles needed 0.100 · 250 / 1000 = 0.025(0) mol	2
	M2 M1 · 166.0 = 4.15 g	
1(a)(ii)	(Re)weigh the empty weighing boat (and the difference should be 4.15 g)	1
1(a)(iii)	M1 (pour using a funnel and) rinse the beaker with (distilled) water	2
	M2 add (distilled) water dropwise near the mark	
1(b)	the solution in the burette is at the expected concentration	1
1(c)	12.50 (cm ³)	1
1(d)(i)	step 4	1
1(d)(ii)	the recorded times are repeatable / the recorded times can be duplicated / the repeated times are close to one another	1
1(d)(iii)	0.5(00)%	1
1(d)(iv)	acid is in excess	1
1(d)(v)	M1 independent: (relative) concentration of KI / (relative) concentration of I-	2
	M2 dependent: time (taken)	

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Question	Answer						Marks	
1(e)(i)		v/cm³	log v	t _{av} /s	$(1/t_{av})/s^{-1}$	log(1 / t _{av})		2
		5.00	0.699	219	0.00457	-2.34		
		10.00	1.00	113	0.00885	-2.05		
		12.50	1.10	100	0.0100	-2.00		
		15.00	1.18	76.5	0.0131	-1.88		
		20.00	1.30	59.0	0.0169	-1.77		
		25.00	1.40	48.0	0.0208	-1.68		
	M1 column 3 and column M2 column 3 and column		ally correct					
1(e)(ii)	M1 points plotted M2 line of best fit							2
1(e)(iii)	M1 correct co-ordinates M2 correct gradient (to 3 s M3 first order	sf)						3

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Question	Answer	Marks
2(a)	$Ag^{+}(aq) + Ct(aq) \rightarrow AgCt(s)$	1
2(b)(i)	M1 (buchner) funnel (with filter paper) M2 sealed with a cork around the funnel	2
2(b)(ii)	increased rate (of filtration)	1
2(c)(i)	warm / heat to constant mass	1
2(c)(ii)	(5.736 g AND 5.736 / 143.4 =) 0.04(00)	1
2(c)(iii)	M1 mol of MC l_2 = 0.04 / 2 = 0.02(00) M2 molar mass of MC l_2 = 3.172 / 0.02 = 158.6 M3 A_r of M = 158.6 – 71.0 = 87.6 and Sr	3
2(c)(iv)	increase because tap water contains chloride ions	1