CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Advanced Level

MARK SCHEME for the May/June 2015 series

9701 CHEMISTRY

9701/52

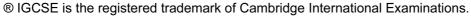
Paper 5 (Planning, Analysis and Evaluation), maximum raw mark 30

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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2015 series for most Cambridge IGCSE[®], Cambridge International A and AS Level components and some Cambridge O Level components.





Page 2	Mark Scheme	Syllabus	Paper
	Cambridge International A Level – May/June 2015	9701	52

Question	Expected Answer	Mark
1 (a) (i)	2H ⁺ (aq) + 2e	[1]
	4OH (aq) ——> $O_2(g) + 2H_2O(I) + 4e$ OR $2H_2O(I)$ —> $O_2(g) + 4H^+(aq) + 4e$ \checkmark	[1]
(ii)	Any straight line from the origin which has double the oxygen volume at a given time ✓	[1]
(iii)	Any straight line from the origin which has 0.45/0.75 x oxygen volume at a given time✓	[1]
(b) (i)	Circuit has an ammeter in series and is complete ✓	[1]
	Gases are released at the correct electrode ✓	[1]
	Diagram shows collection of hydrogen using a means of measuring the volume of the gas ✓	[1]
	Diagram shows carbon dioxide from the anode being absorbed into a named alkali ✓	[1]
	Diagram then shows ethene being collected using a means of measuring the volume of the gas ✓	[1]
(ii)	The current/ammeter reading The time taken The volume of hydrogen The volume of ethene Mass of alkali before Mass of alkali after	[1]
	3 of the above ✓ 4 or more of the measurements made ✓	[1]

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge International A Level – May/June 2015	9701	52

(iii)	(N =) 24 000 x C/V ✓	[1]
(iv)	N/96500 ✓	[1]
(v)	Any correctly balanced equation for the reaction of carbon dioxide and an alkali ✓	[1]
(vi)	But-2-ene ✓	[1]
		[15]

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge International A Level – May/June 2015	9701	52

2 (a) (i)	$Na_2CO_3 + 2HX \longrightarrow 2NaX + CO_2 + H_2O \checkmark$	[1]
(ii)	1 mol of Na₂CO₃ reacts with 2 mol of HX ✓	[1]
(b) (i)	$K_a = [H^+]^2/[HX]$ \checkmark	[1]
(ii)	[H ⁺] = 0.00372 ✓	[1]
	$[H^{\dagger}]^2/[HX] = 0.000138$ OR (answer above) $^2/0.1$ \checkmark	
	OR	[1]
	pK _a = 2pH + log[HX] ✓	
	= 4.86 − 1 ✓	
(c) (i)	All points plotted correctly ✓	[1]
	Appropriate curve of best-fit is drawn ✓	[1]
(ii)	Circles the point at mass of NaX = 0.3g ✓	[1]
	If anomaly is below the line: NaX might not have fully dissolved/mixture not stirred/too little NaX added ✓	
	If anomaly is above the line; Too much NaX added	[1]
(d) (i)	At pH 3.86, [HX] = [NaX] OR [X] ✓	[1]
	Calculates M _r of NaX = 112 or [X] =89 ✓	[1]
	Calculates M _r of HX as 90 ✓	[1]
(ii)	Structure given has both an –OH and a –COOH group and has rmm = ans(d)(i) ✓	1

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge International A Level – May/June 2015	9701	52

(e)	Any two from: spitting HX vaporises/evaporates HX decomposes OR is thermally unstable ✓✓	[2]
		[15]