CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2015 series

0620 CHEMISTRY

0620/63 Paper 6 (Alternative to Practical), maximum raw mark 60

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 October/November 2015 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

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Abbreviations used in the Mark Scheme

- ; separates marking points
- / separates alternatives within a marking point
- () the word or phrase in brackets is not required but sets the context
- **A** accept (a less than ideal answer which should be marked correct)
- **I** ignore (mark as if this material were not present)
- **R** reject
- ecf credit a correct statement that follows a previous wrong response
- ora or reverse argument
- owtte or words to that effect (accept other ways of expressing the same idea)

Question	Answer	Marks	Additional Guidance
1(a)	spatula; evaporating dish / basin;	1 1	**A:** spoon **R:** watch glass / clock glass / crucible / petri dish
1(b)(i)	crush / powder / grind / pound zinc carbonate; add to acid **and** stir / mix; (until) no more bubbles / excess carbonate / solid remains;	1 1 1	**I:** reaction is over
1(b)(ii)	filter / filtration etc.;	1	**R:** 'filter funnel' / 'filter paper' only
1(b)(iii)	2 from: • evaporate; • until crystallisation point / crystals (start to) form / saturated; • leave to cool;	1	**I:** heat or evaporating basin (in diagram) **R:** 'to dryness'

Question	Answer	Marks	Additional Guidance
2(a)	electroplating;	1	**R:** electrolysis
2(b)	prevent rusting / corrosion / attractive appearance / shiny;	1	
2(c)	the negative / cathode;	1	
2(d)	**M1** chromium (salt) / chromium + *any named* anion; **M2** nitrate / sulfate / chloride / ethanoate / *suitable* named anion;	1 1	**M2** is dependent on **M1**
2(e)	coating will not stick / be even / dirt or grease will be trapped;	1	**I:** it will not conduct
2(f)	spoon not completely immersed in electrolyte / only half of spoon will be plated;	1	

Question	Answer	Marks	Additional Guidance
3(a)	all temperatures correctly recorded: 30, 35, 33, 29 4 correct = 2 3 correct = 1 2 or fewer correct = 0 temperature rises: 5, 10, 8, 4;	**2** **1**	**I:** trailing zeros **I:** trailing zeros
3(b)	idea of fair test / comparability of results / only one variable / control (variable);	**1**	
3(c)	4 points plotted correctly, ± half a small square; **two** intersecting straight lines drawn with a ruler; through points 1 and 2 **and** 3 and 4, extrapolated to intersect;	**1** **1** **1**	**I:** origins
3(d)(i)	11 °C;	**1**	ecf from the graph, ± 0.1 °C **I:** absence of arrow
3(d)(ii)	C = 28 **and** D = 22; cm^3;	**1** **1**	ecf from the graph, C + D = 50
3(e)	22 (°C) / 2 × value from **(d)(i)**;	**1**	answer must be a number **I:** units / lack of units

Question	Answer	Marks	Additional Guidance
4(a)	green; precipitate;	**1** **1**	use list principle for extra incorrect observations
4(b)	correct table of results for Experiment 1: final volumes, initial volumes and difference: 10.8 0.0 10.8; all readings in **both** tables to 1 decimal place;	**1** **1**	
4(c)	correct table of results for Experiment 2: final volumes and initial volumes: 12.3 6.9; difference correct: 5.4;	**1** **1**	 **A:** ecf (usually 6.6)
4(d)(i)	to remove **M** / residue / impurities / to clean it;	**1**	
4(d)(ii)	to remove water / so **N** is not diluted;	**1**	**R: N** reacts with water
4(e)	there is already a colour change / self-indicating / it goes pink / owtte; **M** and **N** change colour or show when the reaction is complete;	**1** **1**	**A:** it is not acid-alkali / potassium permanganate or solutions **I:** potassium permanganate / solutions **M** and **N** are coloured
4(f)(i)	Experiment 2 / solution **M** / the first titration;	**1**	
4(f)(ii)	Experiment 2 uses 2 × volume of Experiment 3 ora;	**1**	**A:** (nearly) 2 × / (13.7 *v*. 6.6)
4(f)(iii)	twice as concentrated / strong ora;	**2**	**A:** solution **N** more concentrated / stronger for 1 mark ora **R:** references to conc. of solution **L** (iron(II) sulfate)
4(g)	half value from table result for Experiment 3 / 2.7; half volume (of **L**) used;	**1** **1**	**R:** just 'half the volume' **A:** this shown by calculation
4(h)	*advantage* easy to use / quick / convenient; *disadvantage* not accurate owtte;	**1** **1**	**I:** reference to large volumes

Question	Answer	Marks	Additional Guidance
5(f)	hydrogen / H_2;	**1**	
5(g)	hydrated / water; acid;	**1** **1**	**A:** hydrous **I:** other conclusions unless contradictory
5(h)	(grey /) white (solid);	**1**	**I:** crystals **R:** pale blue
5(i)	temperature increase / rise; blue (solution);	**1**	additional incorrect observations, such as bubbles, contradicts a correct observation **I:** state and starting colour
5(j)	blue; precipitate;	**1** **1**	
5(k)	blue precipitate; dissolves / soluble / solution; deep / dark / royal blue (solution);	**1** **1** **1**	

Question	Answer	Marks	Additional Guidance
6	6 from: • uses different (at least two) concentrations of sulfuric acid; • made by diluting with water; • same total volume of (diluted) sulfuric acid; • same mass / amount / size / length / surface area of magnesium (ribbon); • measure time (or run at the same time); • for magnesium to dissolve or react or disappear / *y* cm^3 gas to collect / volume collected (set time) / bubbles to stop / mass to decrease by x g / mass to stop decreasing; • compare times of reaction / results;	**6**	**A:** implication of this last two marking points are dependent on measuring time