

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

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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)

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Question	Answer	Marks	Additional Guidance
1(a)	spatula; <u>evaporating</u> 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: <ul style="list-style-type: none"> • <u>evaporate</u>; • 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 + <i>any named</i> anion; M2 nitrate / sulfate / chloride / ethanoate / <i>suitable</i> 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	

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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, $\pm$ half a small square; two intersecting <u>straight</u> 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 $\times$ value from (d)(i) ;	1	answer must be a number I: units/lack of units

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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 <u>change</u> 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)	<i>advantage</i> easy to use /quick /convenient; <i>disadvantage</i> not accurate owtte;	1 1	I: reference to large volumes

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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	

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Question	Answer	Marks	Additional Guidance
6	<p>6 from:</p> <ul style="list-style-type: none"> • 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 / ycm^3 gas to collect / volume collected (set time) / bubbles to stop / mass to decrease by xg / mass to stop decreasing; • compare times of reaction / results; 	6	<p>A: implication of this</p> <p>last two marking points are dependent on measuring time</p>