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Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2015 series

0620 CHEMISTRY

0620/62 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	Guidance
1(a)	pipette; burette;	**1** **1**	**I:** dropper **R:** teat pipette
1(b)	named indicator;	**1**	**I:** references to indicator paper **R:** Universal Indicator
1(c)	all volumes correct: 16.3, 16.9, 16.2, 16.1 4 correct = 2 3 correct = 1 2 or fewer correct = 0	**2**	
1(d)(i)	neutralisation / acid-base reaction / exothermic;	**1**	
1(d)(ii)	(indicator) changed colour;	**1**	**A:** incorrect colour changes
1(e)(i)	Experiment 2 / the second one / 16.9;	**1**	ecf on **(c)**
1(e)(ii)	measuring or recording error / overshot end-point / manual error with burette;	**1**	**A:** incorrect volume of sodium hydroxide used **I:** human error
1(e)(iii)	16.2; cm^3;	**1** **1**	ecf on **(c)**
1(f)	hydrochloric acid; less volume used than sodium hydroxide;	**1** **1**	

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Question	Answer	Marks	Guidance
2(a)	chromatography;	1	
2(b)	(teat) pipette / capillary tube;	1	**A:** dropper / glass rod
2(c)	water / organic solvent;	1	
2(d)	compound Q is insoluble;	1	**R:** it reacts with the solvent
2(e)	between (4.7 and 5.1) divided by (6.2 or 6.3); answer: between 0.74 and 0.82;	1 1	correct answer with no working scores 2

Question	Answer	Marks	Guidance
3(a)	all temperatures correctly recorded: 23, 36, 47, 58, 70, 79 6 correct = 3 5 correct = 2 4 correct = 1 3 or fewer correct = 0	3	
3(b)	all points correctly plotted: 23, 36, 47, 58, 70, 79 6 correct = 2 5 correct = 1 4 correct = 0 smooth curve;	2 1	
3(c)	third point / at 47 °C or 99 s; not on smooth line / curve;	1 1	
3(d)	118; seconds / sec / s; indication on the graph;	1 1 1	
3(e)(i)	(it) increases / higher the temperature faster reaction;	1	**I:** references to time (rather than rate)

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Question	Answer	Marks	Guidance
3(e)(ii)	particles have more energy / move faster; more (chance of / successful) collisions;	1 1	
3(f)(i)	slower reaction / longer time; smaller surface area;	1 1	
3(f)(ii)	sketch above the curve not touching the original at any point;	1	**A:** curve above but touching the anomalous point
3(g)	to prevent escape of / splash of acid; to allow carbon dioxide / gas to escape;	1 1	**R:** prevent spillages

Question	Answer	Marks	Guidance
4	*tests on ethene* bromine (water); turns colourless; *ammonia* red litmus / pH paper; turns blue / pH > 7; *oxygen* glowing splint; relights;	 1 1 1 1 1 1	**A:** Allow any test which gives only a **unique detectable result** for that substance, e.g. lighted splint / ethene burns. **R:** relights a lighted splint **A:** lighted splint glows brighter

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Question	Answer	Marks	Guidance
5(c)	copper; chloride;	**1** **1**	**I:** any reference to copper's oxidation state
5(d)	colourless;	**1**	**R:** white / pale yellow
5(e)(i)	white; precipitate ; insoluble / no change / no reaction ;	**1** **1** **1**	**R:** colourless
5(e)(ii)	no precipitate / slight white precipitate; no change / no reaction;	**1** **1**	
5(e)(iii)	yellow; precipitate;	**1** **1**	

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Question	Answer	Marks	Guidance
6	**Method 1: Monitoring the reaction of the metal with acid** 6 from: • named acid; • same or stated volume of (same concentration of) acid; • fair test idea, i.e. same surface area / size / mass / amount metal; • measure volume of gas / count bubbles / temperature change / observe complete reaction; • suitable reference to time; • conclusion / comparison, e.g. most effervescence = most reactive; **Method 2: Displacement reaction** 6 from: • react each metal; • with named acid; • to prepare salt solution of each; • react each metal with each solution of salt; • observe if displacement occurs; • conclusion / comparison;	**6**	**I:** use of heat unless this is identified as the output variable for the experiment

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