CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the May/June 2015 series

0620 CHEMISTRY

0620/62 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 May/June 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
- **OR** gives alternative marking point
- **R** reject
- **I** ignore mark as if this material was not present
- **A** accept (a less than ideal answer which should be marked correct)
- **COND** indicates mark is conditional on previous marking point
- owtte or words to that effect (accept other ways of expressing the same idea)
- max indicates the maximum number of marks that can be awarded
- ecf credit a correct statement that follows a previous wrong response
- ( ) the word/phrase in brackets is not required, but sets the context
- ora or reverse argument

Question	Answer	Marks
1(a)	stand; thermometer;	2
1(b)	initial temperature (of water) / room temperature / temperature change; initial mass of burner / ethanol; final mass of burner / ethanol;	3
1(c)	half / lower temperature change / water would take longer to heat up / slower;	1
1(d)	higher temperature change / water would heat up quicker / copper is a better conductor;	1

Question	Answer	Marks
2(a)	nitric acid / HNO_3;	1
2(b)(i)	spatula;	1
2(b)(ii)	(stirring / glass) rod;	1
2(c)	filtration / decanting;	1
2(d)(i)	anhydrous chromium nitrate / $Cr(NO_3)_3$ / chromium oxide / Cr_2O_3 / hydrated chromium nitrate / $Cr(NO_3)_3.6H_2O$ / solid chromium nitrate;	1
2(d)(ii)	heat / evaporate / boil; to crystallising point owtte; award one mark for any two ideas: cool / filter / decant / wash / dry;	3

Question	Answer	Marks
3	*aqueous potassium hydroxide* named indicator e.g. red litmus; correct colour e.g. turns blue; **OR** pH paper / indicator / meter / probe; >7; **OR** chemical test e.g. copper sulfate solution; correct result e.g. blue precipitate; *octane* lighted splint; liquid catches fire; **OR** add to water; immiscible; *pure water* boiling point / melting point; 100 °C / 0 °C;	**6**
4(f)	volume of sodium thiosulfate: 50, 40, 35, 30, 20 volume of water: 0, 10, 15, 20, 30 all 10 correct = 1 mark; time: 45, 55, 66, 78, 140 all 5 correct for 2 marks 4 correct =1 mark; **all** times in seconds;	**4**
4(g)	all 5 points plotted correctly (2 marks); smooth line graph;	**3**

Question	Answer	Marks
4(h)(i)	correct value from graph, 90-110; units; indication shown on graph;	3
4(h)(ii)	line must be above original;	1
4(i)(i)	experiment 1 / 50 cm^3 sodium thiosulfate / 45 s / no water;	1
4(i)(ii)	more particles of thiosulfate / particles closer together / more concentrated / no water / more (frequent) collisions;	1
4(j)	volume over 50 cm^3 / changing total volume; so not a fair test / so depth greater / cannot compare with other results;	2
4(k)(i)	*any two from:* • more accurate (measurement of volume); • comparison to measuring cylinder; • less accurate measurement of time; • as it takes longer to add the acid;	2
4(k)(ii)	time shorter / cross disappears faster; depth greater;	2

Question	Answer	Marks
5(b)	pungent smell; paper turns blue / purple / green;	2
5(c)	(pale) yellow; precipitate;	2
5(e)	pH 8–14;	1
5(f)	carbon dioxide;	1
5(g)	barium / lead / calcium / silver; carbonate;	2

Question	Answer	Marks
6(a)	platinum;	1
6(b)	opposites attract / hydrogen ions are positive / cations / H^+;	1
6(c)(i)	chlorine;	1
6(c)(ii)	(red or blue) litmus; bleached / goes white;	2
6(d)	gas is soluble / chlorine is soluble / gas dissolves / chlorine dissolves;	1

Question	Answer	Marks
7	*Generic marking points can be applied to any method:* mp1 (fair testing) known or stated volume of tonic water; mp2 (fair testing) repeat with other sample of tonic water; mp3 (reagent) add or react with KOH or Mg turnings etc.; mp4 (method) use of indicator / collect gas etc.; mp5 (endpoint) until colour changes / until no more gas evolved / for one minute etc.; mp6 (measurement) volume of KOH added / volume of gas evolved; mp7 (conclusion) the higher concentration is the one that needs the greater volume of KOH / gives off the most gas etc.;	**max 6**