CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the May/June 2015 series

0620 CHEMISTRY

0620/61 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	Guidance
1(a)(i)	flask;	1	
1(a)(ii)	top arrow water **and** bottom arrow water;	1	
1(b)(i)	to prevent fire / ref. to safety / controlled heating; ethanol is flammable;	2	**I** dangerous
1(b)(ii)	to prevent evaporation / loss of reactants or ethanol;	1	
1(c)	*ethanol:* sweet / nail varnish remover / alcohol / spirit; *ethanoic acid:* vinegar / sour / acid / sharp / pungent;	2	**I** strong / pleasant

Question	Answer	Marks	Guidance
2(a)	bulb lights / silver-grey liquid or solid forms / bubbles;	1	
2(b)(i)	carbon / graphite;	1	
2(b)(ii)	it reacts / is reactive;	1	**A** corrodes / rusts **I** dissolves
2(c)(i)	bromine / Br_2;	1	**R** bromide
2(c)(ii)	bleaches / turns white;	1	
2(d)	lead;	1	**R** lead(II) / lead ions
2(e)	fume cupboard / well-ventilated area;	1	**I** references to goggles / safety clothing

Question	Answer	Marks	Guidance
3(a)	base line / origin clearly labelled on diagram;	1	
3(b)	any organic solvent / ethanol / alcohol / acetone;	1	**R** water / acids
3(c)	3;	1	
3(d)	1 and 3 present; 2 not present; unknown dye present;	3	**I** reference to properties of dyes 1, 2 and 3
3(e)	repeat the experiment / use a different solvent / measure R_f values;	1	

Question	Answer	Marks	Guidance
4(a)	25, 27, 30, 32, 34, 36, 35, 34, 33 all 9 = 3 marks 8 = 2 marks 7 = 1 mark	3	please put an 'x' by any incorrectly plotted points
4(b)	25, 34, 41, 40, 39, 38, 37, 36, 34 all 9 = 3 marks 8 = 2 marks 7 = 1 mark	3	
4(c)	all 18 points plotted within half a small square = 3 marks 17 points plotted within half a small square = 2 marks 16 points plotted within half a small square = 1 mark; smooth line graph; labels;	5	
4(d)	value read from graph, 38.5 °C; indication clearly shown;	2	
4(e)	exothermic;	1	

Question	Answer	Marks	Guidance
4(f)	to remove traces of acid A / clean; to remove water;	2	
4(g)(i)	experiment 2 / acid B;	1	
4(g)(ii)	acid B is stronger / dibasic / has a lower pH / more acidic;	1	**I** more reactive / more concentrated
4(h)	heat losses / using a measuring cylinder / thermometer / cup not washed; insulate / use burette / digital thermom. / new cup;	2	**I** repeat and average

Question	Answer	Marks	Guidance
5(c)	white; precipitate; dissolves / clears;	3	
5(d)	white precipitate;	1	
5(e)	no reaction / no change / no precipitate / colourless solution;	1	
5(f)	white; precipitate;	2	
5(g)	hydrated / water;	1	
5(h)	not a halide / not a named halide;	1	
5(i)(i)	ammonia / NH_3;	1	
5(i)(ii)	ammonium / NH_4^+;	1	

Question	Answer	Marks	Guidance

6	***step 1***
	add copper oxide or catalyst to hydrogen peroxide;
	measure volume of gas / mass loss / collect gas / count bubbles;
	over time;
	known volume of hydrogen peroxide;
	compare to hydrogen peroxide on its own;
	test gas with glowing splint;
	splint relights;
	
	step 2
	filter copper(II) oxide;
	dry;
	weigh;
	compare to original mass;
	OR
	filter (copper(II) oxide) / evaporate to dryness;
	add to hydrogen peroxide;
	measure rate of reaction;
	compare to first experiment;
		max 8	