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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

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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

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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

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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	

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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	

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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	

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