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PHYSICAL SCIENCE

0652/61

Paper 6 Alternative to Practical

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MARK SCHEME

Maximum Mark: 60

Published

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Question	Answer	Marks
1(a)(i)	23.5 ;	1
1(a)(ii)	5.0, 3.0, 16.5 ;	1
1(b)(i)	most = N then L and least = M ; faster bubbles means (metal) more reactive ; highest temperature (change) means (metal) more reactive ;	3
1(b)(ii)	pieces (of metal) same shape / same mass (of metal) / same subdivision / same surface area / same acid concentration ;	1
1(c)	lighted splint AND pop ;	1
1(d)(i)	Filtration / filter(ing) ;	1
1(d)(ii)	sodium hydroxide (solution) / ammonia solution / aqueous ammonia / ammonium hydroxide ;	1
1(d)(iii)	iron / Fe ;	1

Question	Answer	Marks
2(a)	(G is) sulfuric acid ; acid and carbonate gives carbon dioxide ;	2
2(b)	(D is) iron(III) nitrate ; (E and H are) sodium hydroxide and ammonia (but order not known) / (E and H are) alkalis / alkaline ;	2
2(c)	(F is) barium chloride ; barium chloride gives white ppt. with sulphate / sulfuric acid / acid ;	2

Question	Answer	Marks
2(d)	copper sulfate solution ; excess sodium hydroxide gives blue ppt. ; excess ammonia gives dark blue solution ;	3
2(e)	barium chloride / F and white ppt. ;	1

Question	Answer	Marks
3(a)(i)	s, °C, °C ;	1
3(b)	84 ;	1
3(c)	79 ;	1
3(d)	to allow thermometer reading to attain maximum temperature / wtte ;	1
3(e)	(No significant effect) as very similar / same drop in temp. ; in same time ; OR (Decreases) as smaller drop in temp. ; in same time ;	1 1
3(f)(i)	use a lid ;	1
3(f)(ii)	lag the bottom of the beaker / thicker insulation / avp ;	1
3(g)	Any 2 from: room temperature ; initial hot water temperature ; volume / amount of water ;	2

Question	Answer	Marks
4(a)(i)	4.0 ± 0.1 ;	1
4(a)(ii)	20.0 ;	1
4(a)(iii)	inverted triangle seen ;	1
4(b)(i)	80.0, 67.5, 64.0 all values correct ;	1
4(b)(i)	Any 1 from: move screen slowly to / fro until sharpest focus obtained ; repeat each reading <u>and</u> average ; object / lens / screen perpendicular to bench ; object and lens same height above the bench ; carry out experiment away from other bright light sources / darkened room ;	1
4(c)(i)	plots correct to half a small square, at least 6 correct ; good best-fit curve judgement ;	2
4(c)(i)	60 ± 0.5 ;	1
4(d)	15 ; 2/3 s.f. only	2

Question	Answer	Marks
5(a)(i)	measuring cylinder ;	1
5(a)(ii)	conical flask ;	1
5(b)(i)	25.08 ;	1
5(b)(ii)	77.20 ;	1
5(b)(iii)	76.15 / 76.16 ;	1

Question	Answer	Marks
5(b)(iv)	77.20 plotted \pm half small square and curve completed ;	1
5(c)(i)	rate decreases as acid concentration decreases ;	1
5(c)(ii)	temperature affects rate/to ensure temperature has remained constant ;	1
5(d)(i)	Volume / amount of gas ;	1
5(d)(ii)	diagram showing gas syringe / inverted measuring cylinder over water ;	1

Question	Answer	Marks
6(a)	12 ;	1
6(b)	aluminium absorbs / stops alpha and beta ; gamma rays pass through ;	2
6(c)	877, 220, 97, 55, 36, 25	1
6(d)	suitable choice of scales linear and half the grid used ; all 6 plots correct to half a small square scores 2 marks ; 5 correct scores 1 ; smooth curve ;	4
6(e)(i)	distant from source owtte ;	1
6(e)(ii)	protective clothing / use tongs / short exposure time / keep source in lead-lined container ;	1