

Question	Answer	Marks	AO Element	Notes	Guidance
1	D - potassium iodide	1			
2	limewater / calcium hydroxide / $\text{Ca(OH)}_2$	1			
	turns milky / turns cloudy / gives a white precipitate	1			COND
3	lighted splint / flame	1			
	pops / explodes	1			COND
4	pH 9	1			
5	lighted splint (1) pops/explodes (1)	2			
6	$\text{Cl}_2$ / chlorine	1			
7	ammonia / $\text{NH}_3$	1			
8	test: lighted splint / flame (1) result: (squeaky) pop (1)	2			

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9	cream	1			
10	<b>D</b>	1			allow $Cl_2$
11	limewater (1) turns milky / cloudy / white precipitate (1)	2			
12	test: limewater (1) result: turns milky / turns cloudy / white precipitate (1)	2	AO1	<b>note:</b> second mark dependent on first being correct	
13(a)	(hydrochloric acid contains) chloride (ions) / it contains a chloride / you would get a white precipitate	1			
13(b)	chloride: white (precipitate) (1) iodide: yellow (precipitate) (1) precipitate (formed) for both chloride and iodide (1)	3			

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14	<p>1 mark each for any three of:</p> <table border="1"> <tr> <td>aqueous ions tested</td> <td>small volume of aqueous sodium hydroxide</td> <td>aqueous sodium hydroxide in excess</td> </tr> <tr> <td>chromium(III), Cr<sup>3+</sup></td> <td>green ppt (1)</td> <td>(ppt) soluble / (ppt) dissolves (1)</td> </tr> <tr> <td>iron(II), Fe<sup>2+</sup></td> <td>green ppt (1)</td> <td>(ppt) insoluble (1)</td> </tr> </table>	aqueous ions tested	small volume of aqueous sodium hydroxide	aqueous sodium hydroxide in excess	chromium(III), Cr <sup>3+</sup>	green ppt (1)	(ppt) soluble / (ppt) dissolves (1)	iron(II), Fe <sup>2+</sup>	green ppt (1)	(ppt) insoluble (1)	3			
aqueous ions tested	small volume of aqueous sodium hydroxide	aqueous sodium hydroxide in excess												
chromium(III), Cr <sup>3+</sup>	green ppt (1)	(ppt) soluble / (ppt) dissolves (1)												
iron(II), Fe <sup>2+</sup>	green ppt (1)	(ppt) insoluble (1)												
15(a)	octane	1												
15(b)	(aqueous) potassium manganate (VII)	1												
15(c)	hydrochloric acid	1												
15(d)	water	1												
15(e)	ethanol	1												

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16	1 mark each for any three of: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">white precipitate (1)</td> <td>(precipitate) does not dissolve / (precipitate) insoluble / white precipitate remains (1)</td> </tr> <tr> <td>white precipitate (1)</td> <td>(precipitate) dissolves / (precipitate) soluble (in excess) / colourless solution (1)</td> </tr> </table>	white precipitate (1)	(precipitate) does not dissolve / (precipitate) insoluble / white precipitate remains (1)	white precipitate (1)	(precipitate) dissolves / (precipitate) soluble (in excess) / colourless solution (1)	3			
white precipitate (1)	(precipitate) does not dissolve / (precipitate) insoluble / white precipitate remains (1)								
white precipitate (1)	(precipitate) dissolves / (precipitate) soluble (in excess) / colourless solution (1)								
17(a)	K <sup>+</sup>	1							
17(b)	Cr <sup>3+</sup>	1							
17(c)	Ca <sup>2+</sup>	1							
17(d)	Br <sup>-</sup>	1							
17(e)	SO <sub>4</sub> <sup>2-</sup>	1							

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18	(compound / salt) on wooden splint or (nichrome / platinum) wire (1) into (roaring) Bunsen flame (1)	2			
19(a)	(it causes) acid rain	1			
19(b)	test – (aqueous) potassium manganate(VII) (1) (purple to) colourless (1)	2			
20	(add nitric acid and aqueous) silver nitrate (1) cream precipitate (1)	2			
21	(add aqueous) sodium hydroxide / (aqueous) ammonia (1) green precipitate (1)	2			
22	aluminium (1) ammonia (1) red <b>AND</b> blue (in correct spaces) (1)	3			

Question	Answer	Marks	AO Element	Notes	Guidance
23	add (acidified aqueous) silver nitrate (1) yellow precipitate (1)	2			
24	(acidified and add aqueous) barium chloride / barium nitrate forms white precipitate (2) if 2 marks not scored: 1 mark for barium chloride / barium nitrate	2			
25	(acidify with nitric acid and) add (aqueous) silver nitrate <b>AND</b> white precipitate / white solid (2) If 2 marks <b>not</b> scored 1 mark for add (aqueous) silver nitrate	2			
26	flame test / description of flame test (1) flame coloured lilac (1)	2			
27	cream (1) precipitate / solid (1)	2			
28(a)	white precipitate	1			

<b>Question</b>	<b>Answer</b>	<b>Marks</b>	<b>AO Element</b>	<b>Notes</b>	<b>Guidance</b>
28(b)	slight white precipitate / no precipitate	<b>1</b>			
29(a)	lilac	<b>1</b>			
29(b)	it is less dense (than water)	<b>1</b>			
29(c)	bonding pair of electrons and no other electrons on the H atoms	<b>1</b>			
30	flame test / description of flame test (1) flame coloured yellow (1)	<b>2</b>			
31	ammonia (is released) (1) (ammonia is) alkaline / methyl orange is yellow in alkaline conditions (1)	<b>2</b>			
32(a)	bubbles / effervescence / fizzing (1) solid or magnesium dissolves / solid or magnesium disappears (1)	<b>2</b>			
32(b)	lilac flame	<b>1</b>			
32(c)	white precipitate	<b>1</b>			

Question	Answer	Marks	AO Element	Notes	Guidance
33	glowing splint (1) relights (1)	2			
34	glowing splint (1) relights (1)	2			
35	chlorine / $Cl_2$	1			
36	add (aqueous) sodium hydroxide / (aqueous) ammonia <b>AND</b> green precipitate (2) <b>IF 2 marks not scored:</b> 1 mark for add (aqueous) sodium hydroxide / (aqueous) ammonia	2			
37(a)	25 (mg)	1			
37(b)	potassium / $K^+$	1			
37(c)	magnesium sulfate	1			
37(d)	add nitric acid (1) add (aqueous) silver nitrate (1) white precipitate / ppt (1)	3			



Question	Answer	Marks	AO Element	Notes	Guidance
38(a)	hematite	<b>1</b>			
38(b)	one mark each for any <b>3</b> of: • add (hydrochloric) acid • test gas given off with limewater • turns milky / cloudy / white precipitate (this mark dependent on limewater) • carbon dioxide produced	<b>3</b>			
39	(aqueous) silver nitrate (acidified with nitric acid) (1) white precipitate (1)	<b>2</b>			
40	(damp) <u>red</u> litmus (1) turns blue (1)	<b>2</b>			
					[Total: 94]