

Multiple Choice Answers

Q21: B

Multiple Choice Answers

Q22: A

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Q21: B

3(a)(i)	M1 Heat (solid FA 5) AND observe condensation, droplets, steam, water vapour M2 Make an aqueous solution of FA 5 / dissolve in water to use for tests M3 (To portion of the solution) add aqueous NH_3 AND white ppt AND insoluble in excess NH_3 M4 (To portion of the solution) add aqueous barium chloride or barium nitrate AND white precipitate M5 to distinguish sulfate / sulfite (white precipitate from M4) insoluble in hydrochloric OR nitric acid OR KMnO_4 is not decolourised / remains purple (added after M4 or directly to FA 5 (aq))						
3(a)(ii)	<table border="1"> <tr> <td>Zn^{2+}</td><td>X</td></tr> <tr> <td>SO_4^{2-}</td><td>✓</td></tr> <tr> <td>H_2O</td><td>✓</td></tr> </table>	Zn^{2+}	X	SO_4^{2-}	✓	H_2O	✓
Zn^{2+}	X						
SO_4^{2-}	✓						
H_2O	✓						
3(b)(i)	(FA 6) starting colour purple - solid jumps / moves around - black residue - test with glowing splint - splint relights / glows more brightly						
3(b)(ii)	(dark) Green						

3(c)(i)	'No change' 2 correct = *, 3 correct = **																							
	2* = 1 mark																							
	Max mark = 4																							
	<table><tr><th rowspan="2">test</th><th colspan="3">observations</th></tr><tr><th>FA 7</th><th>FA 8</th><th>FA 9</th></tr><tr><td>Test 1 Add hydrogen peroxide</td><td>Bubbles/ effervescence * Purple / FA 7 (solution) to colourless (solution) * (Gas / oxygen) relights glowing splint *</td><td>No change</td><td>Bubbles / effervescence * (Gas/ oxygen) relights glowing splint *</td></tr><tr><td>Test 2 Add sodium hydroxide, then</td><td></td><td>Off-white ppt*</td><td>No change</td></tr><tr><td>leave to stand</td><td></td><td>brown ppt on standing*</td><td></td></tr><tr><td>Test 3 Add aqueous iron(II) sulfate</td><td>Turns colourless / yellow OR colourless / yellow solution formed*</td><td>No change</td><td></td></tr></table>	test	observations			FA 7	FA 8	FA 9	Test 1 Add hydrogen peroxide	Bubbles/ effervescence * Purple / FA 7 (solution) to colourless (solution) * (Gas / oxygen) relights glowing splint *	No change	Bubbles / effervescence * (Gas/ oxygen) relights glowing splint *	Test 2 Add sodium hydroxide, then		Off-white ppt*	No change	leave to stand		brown ppt on standing*		Test 3 Add aqueous iron(II) sulfate	Turns colourless / yellow OR colourless / yellow solution formed*	No change	
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3(c)(ii)	manganese / Mn																							

3(c)(iii)		FA 6 / FA 7	FA 8
	oxidation state	(+)7	(+)2

3(a)(i)	- selects (aqueous) silver nitrate and (aqueous) ammonia * - white ppt * - soluble in (aqueous) ammonia * NaCl * 2 * = 1 mark
3(a)(ii)	(The acid) removes / reacts with the hydrogencarbonate ions OR silver ions react with hydrogencarbonate ions
3(b)(i)	- green (at start) * - turns to a black powder / solid * - powder very fluid / moves around the test-tube * - condensation (on walls of test-tube) * 2 * = 1 mark
3(b)(ii)	- forms green-blue solution * - effervescence * - vigorous reaction * - attempts to test with limewater * - gas / carbon dioxide gives white precipitate / solid with limewater * 2 * = 1 mark

3(b)(iii)	Test 1 Add NaOH(aq)	(pale) blue precipitate insoluble in excess *
	Test 2 Add NH ₃ (aq)	(pale) blue precipitate * (precipitate dissolves forming) dark / deep blue solution in excess *
	Test 3 Add aluminium foil	effervescence / fizzing* (gas) pops with a lighted splint * pink-brown solid * turns colourless / pale blue solution formed * gets hotter *
	Metal ion in FB 7 : Cu ²⁺ *	
2 * = 1 mark		
3(c)(i)	Test 1 Add NaOH(aq)	green precipitate * insoluble in excess * (precipitate) turns brown (on surface) *
	Test 2 Add acidified KMnO ₄	purple to colourless / (pale) yellow solution OR KMnO ₄ decolourised*
	2 * = 1 mark	
	Metal ion in FB 8 : Fe ²⁺	
3(c)(ii)	Redox reaction AND change to colourless linked to reduction of manganate(VII) ions OR change to yellow colour linked to oxidation of Fe ²⁺ or production of Fe ³⁺ .	

3(a)		<i>observations</i>		
	<i>test</i>	FB 6	FB 7	FB 8
	Test 1 MnO ₂	No change	No change	Fizzing * Heat released * (Gas / oxygen) relights a glowing splint *
	Test 2 Mg	Fizzing * Heat released (only award if not awarded for FB 8 test 1) (Gas / hydrogen ignites with) a pop (sound) with a lit splint *	No change / no fizzing	No change
	Test 3 FeSO ₄	No change * (award one * if both no changes highlighted correctly recorded)	Green ppt * (ppt) turns brown (on standing) *	Either solution OR turns AND yellow / yellow-orange / orange-brown / yellow-brown / (light) brown * Fizzing * (Gas / oxygen) relights a glowing splint (only award if not awarded in FB 8 test 1 above)
2 * = 1 mark (round down)				

3(a)(ii)	FB 6 CH ₃ COOH / formula of any acid containing O FB 7 NaOH / formula of any Group 1 hydroxide FB 8 H ₂ O ₂
3(b)(i)	Fizzing* Forms colourless solution* Attempts limewater test* Gas gives white ppt with limewater *
3(b)(ii)	Cream / off-white ppt AND Partially soluble / insoluble in (aqueous) ammonia
3(b)(iii)	M1 Test 1 No change / no ppt AND (on heating) gas / fizzing / ammonia turns litmus blue
	M2 Test 2 Brown or yellow solution OR turns brown or yellow
3(b)(iv)	cations: NH ₄ ⁺ and unknown anions: Br ⁻ and CO ₃ ²⁻
3(b)(v)	Ag ⁺ (aq) + Br ⁻ (aq) → AgBr(s)