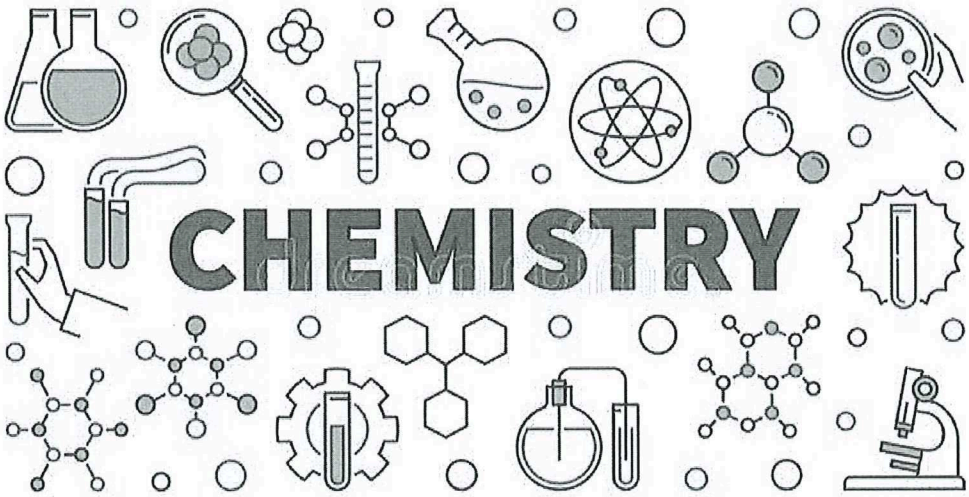
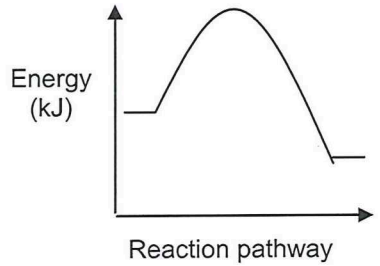


WJEC Chemistry 2

Option – Foundation Tier

2.4 Mark Scheme

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
6	(a)	(i)		2253 (2) if incorrect award (1) for indication of correct bonds to be broken e.g. 3(436) + 945		2		2	2	
		(ii)		2346 (2) if incorrect award (1) for indication of correct bonds to be made e.g. 6(391)		2		2	2	
		(iii)		93 / –93 ecf possible from parts (i) and (ii)		1		1	1	
	(b)				1			1		
	(c)	(i)		decreases		1		1	1	
		(ii)		30 %			1	1	1	

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
	(d)	(i)		nitric acid accept HNO_3	1			1		
		(ii)	I	turns blue	1			1		
			II	alkaline ignore reference to strength of alkali	1			1		
			III	ammonia accept NH_3	1			1		
		(iii)		any of following • runs off fields / farmland • aerial spraying of fertilisers	1			1		
				Question 6 total	**6**	**6**	**1**	**13**	**7**	**0**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
5	*(a)*	(i)		$NaCl + AgNO_3 \rightarrow$ **$NaNO_3$ + AgCl**		1		1		1
		(ii)		silver is more dense than sodium ☐ silver chloride is soluble ☐ silver chloride is insoluble ☑ silver is below sodium in the reactivity series ☐	1			1		1
		(iii)		filtration accept filter / filtering / decanting	1			1		1
	(b)			170 (2) if answer incorrect award (1) for 108 + 14 + (3 × 16)		2		2	2	
	(c)			39.3 (2) if answer incorrect award (1) for $\frac{23}{58.5}$ / 39.316 / 39.32 / 39		2		2	2	
				Question 5 total	**2**	**5**	**0**	**7**	**4**	**3**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
5	(a)	(i)		award (2) for all three correct award (1) for any two correct		2		2	2	2
		(ii)		award (1) for correct order calcium / Ca magnesium / Mg zinc / Zn iron / Fe				1		1
		(iii)		Alex (1) award (1) for any of following copper is a (good) (heat) conductor copper is not an insulator heat can travel through copper (more) easily neutral answer - copper is a metal / copper absorbs heat			2	2		2
		(iv)		award (1) for each correct product $MgSO_4$ Cu ignore any attempt at balancing		2		2		
	(b)			between zinc and iron / below zinc and above iron more reactive than iron but less reactive than the other three metals neutral answer – less reactive than zinc, calcium and magnesium		1		1		1

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
	(c)			5 250 (2) if answer is incorrect award (1) for 50 × 4.2 × 25 ecf possible if incorrect temperature selected from table [or 30 used from part (b)]		2		2	2	
				Question 5 total	**0**	**7**	**3**	**10**	**4**	**6**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
7	(a)	(i)		Gloves need to be worn when using hand warmers ☐ Boiling water is used to recharge battery powered hand warmers ☐ Some chemical reactions give out heat energy ✓ All hand warmers are reusable ☐			1	1		1
		(ii)		award (1) for each of following cheapest accept cheap / only costs £1 least temperature drop (over time) / keeps warmer longer neutral answer – it lasts longer			2	2		2

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
	(b)	(i)		award (2) for all points plotted correctly – tolerance ±½ square award (1) for any 6 points plotted correctly award (1) for smooth curve through all points (from origin)		3		3	3	
		(ii)		2 hours ☐ 3 hours ✓ 4 hours ☐ 5 hours ☐		1		1	1	1
		(iii)		Iron reacts with oxygen forming iron oxide until all the oxygen is used up ☐ Heat formed expands the iron ☐ Iron oxide loses oxygen, forming iron ☐ Iron reacts with oxygen forming iron oxide until all the iron is used up ✓			1	1		1
				Question 7 total	**0**	**4**	**4**	**8**	**4**	**5**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
3	(a)	(i)		conical flask	1			1		1
		(ii)		limewater (1) goes milky / cloudy (1)	2			2		2
		(iii)		the reaction is finished ; the yeast is used up ; the enzymes in the yeast are denatured ✓	1			1		1
	(b)	(i)		award (2) for **all** points plotted correctly tolerance ±½ square award (1) for **any** 4 correct suitable straight line drawn (with ruler) (1)		3		3	3	
		(ii)		15 accept any value in the range 14-16 ecf possible from incorrect graph		1		1	1	
		(iii)		accept any value in the range 160-172 no ecf possible		1		1	1	
				Question 3 total	**4**	**5**	**0**	**9**	**5**	**4**

COMMON QUESTIONS

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
7/1	(a)	(i)		award (1) for any of following • leave to crystallise / evaporate / dry naturally • leave to dry for a few days / until next lesson • leave to dry in a warm place / on window sill / on radiator must have a 'process' and the idea that it happens over a period of time **OR** in a warm place neutral answer – leave to dry	1			1		1
		(ii)		no fizzing / bubbles / effervescence (with oxide) (1) because no carbon dioxide produced (1) alternative answer black powder (rather than green) would be left in the beaker when all the acid has reacted (1) because copper(II) oxide is black (not green) (1)			2	2		2
		(iii)		$CuSO_4 + H_2O$ award (1) for each correct product		2		2		

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
	(b)	(i)		<table><tr><td>Part of the energy profile</td><td>Letter</td></tr><tr><td>energy change for the reaction</td><td>C</td></tr><tr><td>energy of the reactants</td><td>A</td></tr><tr><td>activation energy of the reaction</td><td>B</td></tr></table> award (2) for **all** three correct award (1) for **any** one correct	2			2		
		(ii)		the (minimum) energy required for a reaction to happen / start accept 'the <u>minimum</u> energy required to activate the reaction' neutral answer – the energy required to activate the reaction	1			1		
		(iii)		award (1) for any of following • the energy of the products is lower than the energy of the reactants • the product line is below the reactant line / **E** is below **A** • energy given out is greater than energy taken in / **D** is greater than **B** • lower energy at the end than at the beginning neutral answer – negative energy change		1		1		
				Question 7/1 total	**4**	**3**	**2**	**9**	**0**	**3**