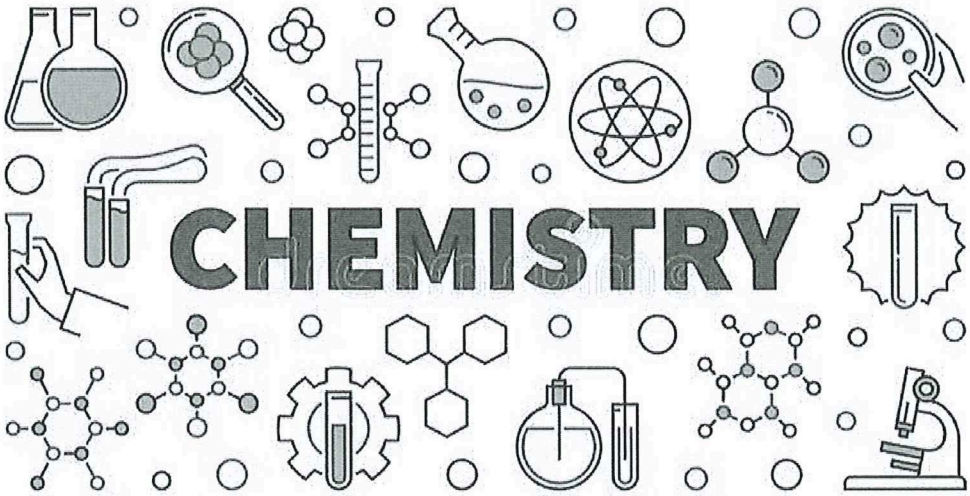

WJEC Chemistry 1

Option – Foundation Tier

1.5 Mark Scheme

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
9/2	(a)			62	1			1		1
	(b)			all points plotted accurately (2) ± 1 square ecf from (a) any 5 points plotted accurately (1) curve of best fit (1)		2	1	3	3	3
	(c)			curve to left of original (1) volume of carbon dioxide goes from 0 to 90 (1)			2	2	2	2
	(d)			more particles (1) greater ***chance*** of collisions / greater ***frequency*** of collisions / more collisions ***per second*** (1) neutral answer: more collisions higher rate (of reaction) / faster reaction (1)	3			3		
	(e)			downward curve from (0,179.80) (1) becomes horizontal at (40,179.63) (1)			2	2	2	2
				Question 9/2 total	**4**	**2**	**5**	**11**	**7**	**8**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
5	(a)			O_2 on products side (1) 2 in box (1) balancing mark only awarded if O_2 correct		2		2	1	
	(b)	(i)		catalyst 1 is least effective because it has the lowest volume of gas collected after any given time / has the slowest reaction			1	1		1
		(ii)		all points plotted correctly (2) 4/5 points plotted correctly (1) tolerance ± ½ square curve through points from origin (1) ecf possible if plotting errors		3		3	3	
		(iii)		steeper curve (1) reaching final volume of 80 (1)		2		2	1	2
		(iv)		can replace bung / delivery tube before reaction starts (1) no loss of gas (1)			2	2		2
				Question 5 total	**0**	**7**	**3**	**10**	**5**	**5**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
8	*(a)*	(i)		$2NaCl$		1		1		
		(ii)		an insoluble solid formed during a reaction		1		1		1
		(iii)		all points plotted correctly (2) any four or five points plotted correctly (1) tolerance ±½ small square appropriate smooth curve drawn through points (1)		3		3	3	3
		(iv)		as concentration increases, **time** decreases			1	1	1	
		(v)		as concentration increases, **rate** increases			1	1	1	
	(b)	(i)		as temperature increases, reaction rate increases (1) accept 'as temperature increases, reaction time decreases' curve is steeper at higher temperatures (1) accept 'curve becomes horizontal more quickly at higher temperatures'			2	2	1	2
		(ii)		dirty tube / tube not washed out properly			1	1		1
				Question 8 total	**0**	**5**	**5**	**10**	**6**	**7**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
11	*(a)*			award (1) each for up to **two** of following • speeds up a chemical reaction • lowers activation energy • not used up during the reaction doesn't take part in the reaction - neutral answer	2			2		
	(b)	(i)		award (1) for any <u>comparison</u> of active ranges • **A** works in pH range of 0.5-4.5 <u>and</u> **B** works in pH range 3-8 • **A** works at a lower pH range / **B** works at a higher pH range • **A** works over a narrower pH range / **B** works over a wider pH range award (1) for <u>comparison</u> of optimum pH e.g. • **A** works best at pH 2 <u>and</u> **B** works best at pH 5.5 • **A** works best at a lower pH / **B** works best at a higher pH award (1) for <u>comparison</u> of activity at given points • both have the same activity at their optimum pH • both have the same activity at pH 3.75 up to maximum (2)			2	2		
		(ii)		curve drawn rising from pH 5 then falling to pH 9 (1) peak at pH 7 (1)			2	2		
				Question 11 total	**2**	**0**	**4**	**6**	**0**	**0**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
7	(a)			award (2) for 6 correct points (tolerance ±½ square) award (1) for any 4 or 5 correct points award (1) for straight line through points does not need to be drawn to origin		2 1		3	3	
	(b)			award (2) for high-level quantitative description • as the concentration doubles, the volume of gas doubles • concentration and volume of gas are directly proportional award (1) for lower-level description • as the concentration increases, the volume of gas increases • concentration and volume are proportional • concentration and volume are directly correlated • concentration and volume have a linear relationship			2	2		2
	(c)			more (1) collide (1) gas (1)	2	1		3		1
	(d)			award (1) each for any **two** of following • increase temperature / warm / heat / hotter • increase surface area (of chalk) / smaller pieces / cut chalk up / powder chalk [do not accept smaller surface area] • (add) catalyst (1) award (1) for 'change' surface area <u>and</u> temperature with no reference to 'increase' if no other mark awarded			2	2		2
				Question 7 total	**2**	**3**	**5**	**10**	**3**	**5**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
4	(a)			$Mg + HCl \longrightarrow MgCl_2 + H$ ☐ $Mg + 2HCl \longrightarrow MgCl_2 + 2H$ ☐ $Mg + 2HCl \longrightarrow MgCl_2 + H_2$ ✓		1		1		
	(b)	(i)		award (2) for all points plotted correctly – tolerance ±1 square award (1) for any three points plotted correctly award (1) for (smooth) curve drawn through points judgement by eye ecf possible from incorrectly plotted points		3		3	3	
		(ii)		decreases increases			2	2		
		(iii)		more (1) a greater (1)	2			2		

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
		(iv)		Increasing the temperature of the acid ✓ Using a lump of magnesium ☐ Using a different apparatus ☐ Using magnesium powder ✓ Decreasing the temperature of the acid ☐			2	2		2
				Question 4 total	**2**	**4**	**4**	**10**	**3**	**2**