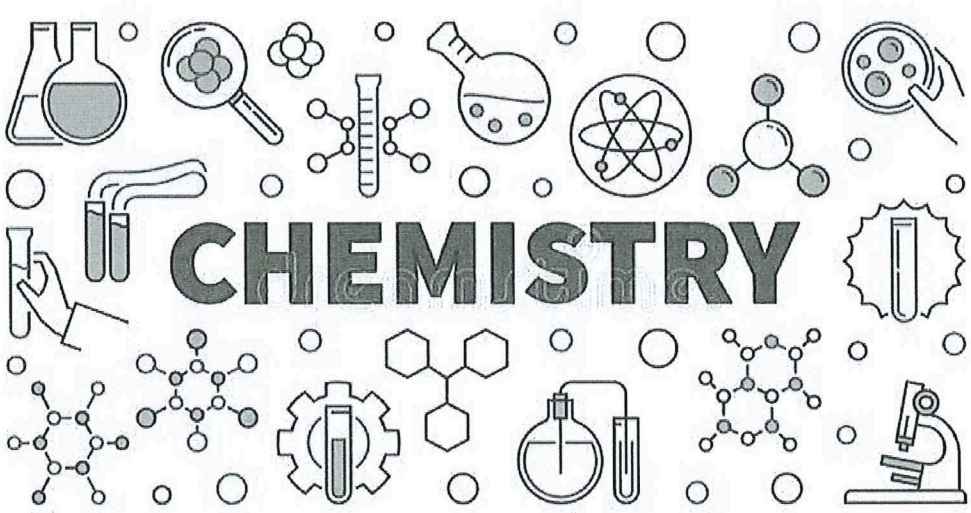
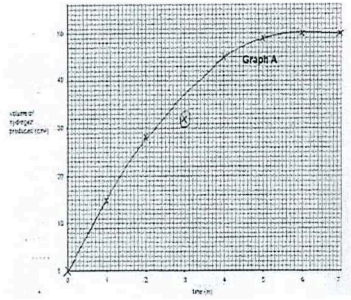
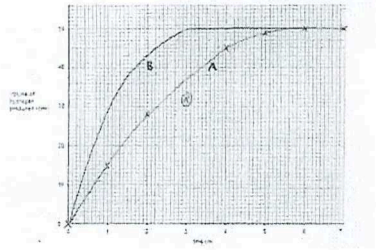


WJEC Chemistry 1

Dual Award – Foundation Tier

1.5 Mark Scheme

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
4	(a)			fizzing / bubbling / effervescence (1) magnesium used up / gets smaller / disappears (1) neutral answers: exothermic / gas forms / hydrogen forms	2			2		2
	(b)			$Mg + 2HCl \longrightarrow MgCl_2 + H_2$ correct reactants (1) correct products (1) balancing (1) – can only be awarded if both the reactants and products are correct		3		3	1	
	(c)	(i)		 all plots correct (2) tolerance ± ½ square any 5 plots correct (1) curve missing out point at 3 minutes (1) no credit for joining points using a ruler		2	1	3	3	

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
		(ii)	I	21 / 22 cm^3 (accept without unit) accept alternative answers correctly read from the graph	1			1	1	1
			II	6 minutes / min(s) unit **needed** accept correct answer in seconds / minutes and seconds accept alternative values between 5 and 6 minutes based on graph		1		1	1	1
		(iii)		 steeper gradient (1) reaching same end point in less time (1)			2	2		2
				Question 4 total	**3**	**6**	**3**	**12**	**6**	**6**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
5	(a)			H_2O_2			1	1		
	(b)	(i)		40 ±1		1		1	1	
		(ii)		lead oxide is the best catalyst – credit for reason any of following • it produces oxygen at a faster rate than the other catalysts • it produces more oxygen in 120s than the other catalysts • it gives a steeper curve than the other catalysts • it reacts fastest			1	1		1
		(iii)		the same mass of all catalysts is left over ✓	1			1		1

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
	(c)	(i)		mesh has greater surface area (1) more collisions (1)	2			2		2
		(ii)		they cause global warming ✓			1	1		
		(iii)		more nitrogen oxides are converted than carbon monoxide up to 100°C ✓			1	1		
		(iv)		award (1) for statement of opinion with basic reason e.g. not very effective because not all harmful gases are converted or effective because it removes most of the harmful gases award additional (1) for further detail from passage/data e.g. • it takes 30 minutes for a catalytic converter to work effectively • harmful gases can still escape in the first 30 minutes of a journey • catalytic converters are not effective for short journeys / journeys that take less than 30 minutes • pollutant gases / carbon monoxide and nitrogen oxides will not be converted into harmless gases at low temperatures • after 30 minutes up to 60-70% conversion of carbon monoxide and nitrogen oxides into "safe" gases			2	2		
				Question 5 total	**3**	**1**	**6**	**10**	**1**	**4**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
7	*(a)*			mass decreases (with time) (1) due to carbon dioxide / gas being released (and lost to the atmosphere) (1)			2	2		2
	(b)	(i)		3 minutes		1		1	1	1
		(ii)		from 0 – 0.5 minutes ✓ from 1 – 1.5 minutes from 2 – 2.5 minutes from 3 – 3.5 minutes			1	1		1
	(c)			1.5 (2) if answer incorrect award (1) for 100 – 97		2		2	2	
	(d)			curve drawn above / to the right of original curve does not have to reach 96.8 if still falling must start at 100 and not go below 96.8			1	1		1
				Question 7 total	**0**	**3**	**4**	**7**	**3**	**5**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
2	(a)	(i)		award (1) for either of following copper … because there are no bubbles copper … because there is no rise in temperature (accept no change in temperature) neutral answer – no reaction		1		1		1
		(ii)		51		1		1	1	1
	(b)			exothermic	1			1		
	(c)	(i)		award (2) for all points plotted correctly – tolerance ±½ small square award (1) for 4 or 5 points plotted correctly award (1) for suitable curve from origin		3		3	3	
		(ii)		Graph stops at 60 s ☐ Graph is still rising at 60 s ✓ Graph reaches a maximum temperature of 56 °C ☐			1	1		

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
		(iii)		The particles collide with less energy so less chance of successful collisions ☐ The particles move slower so less chance of successful collisions ☐ The particles have less surface area so less chance of successful collisions ☐ The particles get used up so less chance of successful collisions ✓	1			1		
		(iv)		increase the temperature (of the acid) (1) increase the concentration (of the acid) (1) accept use stronger acid neutral answer – use a catalyst / any reference to magnesium	2			2		2
		(v)		$MgCl_2$		1		1		
				Question 2 total	**4**	**6**	**1**	**11**	**4**	**4**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
4	(a)	(i)		24		1		1	1	1
		(ii)		accept any value in the range 4.7-5.0			1	1	1	1
		(iii)		1 ✓ 2 ☐ 3 ☐			1	1		1
		(iv)		0.25 (2) if answer incorrect award (1) for either of following indication of time of 30s indication of calculation using 0.5 i.e. $\frac{7.5}{0.5}$ / 15			2	2	2	
	(b)	(i)		**B**	1			1		1
		(ii)		more (1) a greater (1)	2			2		
				Question 4 total	**3**	**1**	**4**	**8**	**4**	**4**