



Mark Scheme (Results)

Summer 2026

Pearson Edexcel International GCSE in Chemistry

4CH1/2C

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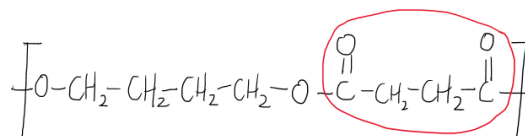
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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question number	Answer		Notes	Marks
1 (a)		Description	Name	4
		a monomer used to make an addition polymer	alkene	
		a monomer used to make a condensation polymer	dicarboxylic acid	
		a type of polymer that biodegrades	condensation	
		a product of condensation polymerisation	water	
(b)	<p>C</p> $\left[\begin{array}{cc} \text{H} & \text{CH}_3 \\ & \\ -\text{C} & - & \text{C}- \\ & \\ \text{H} & \text{H} \end{array} \right]$ <p><i>A is not the correct answer because the repeating unit does not have three carbons in a row.</i> <i>B is not the correct answer because the repeating unit does not have a double bond.</i> <i>D is not the correct answer because the repeating unit does not have a double bond or three carbons in a row.</i></p>			1
(c) (i)	$\text{C}_4\text{H}_6\text{O}_4$			1
(ii)	$\text{.....} + 2 \text{Na} \rightarrow \text{....} + \text{H}_2$ <p>M1 for Na and H₂/H-H M2 for correct balancing</p>		M2 dep on M1	2
(iii)	 <p>M1 for circling any 4 adjacent carbons M2 for circling the correct 4 adjacent carbons including the two C=O</p>		If fewer/more than 4 carbons are circled then 0 marks IGNORE C-O- if circled M2 dep on M1	2
				Total 10

Question number	Answer	Notes	Marks
2 (a)	nitrate	ACCEPT NO_3^- penalise incorrect letter cases and subscripts	1
(b)	Any two answers from the following: M1 there should not be a bung (on the top of the burette) M2 a (conical) flask should be used (instead of a beaker) M3 - a white tile is needed	IGNORE size of conical flask IGNORE any comments related to the clamp stand/adding acid to burette/using pipette to transfer alkali	2
(c)	M1 use an indicator (at the start) any two from the following: M2 Add 25.0 cm^3 of NaOH using a pipette M3 rinse burette with acid solution (before filling) M4 make sure that the jet/space between tap and tip contains liquid only M5 swirl/stir (when adding the acid) M6 add dropwise close to the endpoint/near the end	ACCEPT any suitable named indicator REJECT universal indicator for M1 ALLOW remove bubbles in the burette IGNORE add dropwise (from the start) IGNORE doing a trial	3
(d) (i)	ticks in boxes 1, 3 and 4	one incorrect or missing tick scores 0	1
(ii)	M1 $(22.95 + 23.05 + 22.90) \div 3$ M2 = 22.97	22.97 without working scores 2 23.0 with or without working scores 1 If no results ticked then only use of 2 or 3 concordant titres can score both marks in (ii) If only one result ticked then M2 can be scored for averaging two or	2

			more titre values correctly M1 consequential on results ticked M2 consequential on correct calculation from M1 answer to M2 must be correct to 2 dp	
(e)	(i)	M1 alkali M2 contains hydroxide ions / OH ⁻	ALLOW is a proton acceptor M2 dep on M1	2
	(ii)	M1 ($0.55 \times 1000 =$) 550 (g) M2 amount of sodium hydroxide = $550 \div 40$ (= 13.75 mol) M3 energy released = $13.75 \times 47 = 646(.25)$	ECF from M1 13.75 scores M1 and M2 ECF from M2 0.646(25) scores 2 ACCEPT any number of SF except 1	3
				Total 14

Question number	Answer	Notes	Marks
3 (a) (i)	M1 (electrostatic) attraction between the shared pair of electrons		2
	M2 and the (positive) nuclei	REJECT nucleus for M2	
(ii)	there are no electrons free to move/no delocalised electrons	IGNORE reference to ions/free electrons alone	1
(b) (i)	M1 graphite	IGNORE carbon	2
	M2 conducts electricity / high melting point / resistance to high temperature	ALLOW platinum/a named transition metal	
		ALLOW doesn't react with product/is inert	
		M1 and M2 mark independently	
(ii)	cations		1
(iii)	$2\text{Br}^- \rightarrow \text{Br}_2 + 2\text{e}^{(-)}$		1
(iv)	electrons	IGNORE delocalised/charged particles	1
		REJECT (named) ions	
(c) (i)	M1 sodium / Na		2
	M2 hydrogen / H_2		
(ii)		Penalise incorrect use of ide/ine once only	3
	M1 chloride ions are attracted to the positive electrode/anode		
	M2 chloride ions lose/give up electrons (to form chlorine atoms)	ALLOW $\text{Cl}^- \rightarrow \text{Cl} + \text{e}^{(-)}$	
	M3 and (combine in pairs to) form chlorine molecules/ Cl_2 OWTTE	ALLOW	
		$2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}^{(-)}$	
		Scores M2 and M3	
(iii)		Correct answer with or without working scores 2	2
	M1 $(5000 \times 24\,000 =) 120\,000\,000 \text{ (cm}^3\text{)}$		
	M2 $120\,000 \text{ (dm}^3\text{)}$	ALLOW	
		$5000 \times 24 = 120\,000 \text{ (dm}^3\text{)}$ scores 2	
		Total 15	

Question number		Answer	Notes	Marks
4	(a)	lilac (flame)		1
	(b) (i)	the test is for chlorine gas (not chloride ions)		1
	(ii)	M1 add (nitric) acid and silver nitrate	REJECT other named acids ALLOW correct formulae	2
		M2 white precipitate	M2 dep on silver nitrate in M1	
	(c)	M1 amount of KCl ($= 0.25 \times 0.500$) = 0.125 mol		6
		M2 mass of KCl ($= 0.125 \times 74.5$) = 9.31 g	9.3(1) scores M1 and M2 ECF for M2	
		M3 measure out the (calculated mass of) KCl using a (mass) balance	ACCEPT (measuring) scales	
		M4 place/transfer KCl into a suitable container	ALLOW beaker	
		M5 add (deionised) water until a total solution volume (of 250 cm ³) is reached using a measuring cylinder/pipette/burette	ALLOW add distilled water to the line for M5 when (250 cm ³) volumetric flask is given for M4	
		M6 stir (using a stirring rod) until KCl has dissolved	ALLOW invert volumetric flask for M6	
Total 10				

Question number	Answer	Notes	Marks
5 (a)	<p>M1</p> $\begin{array}{c} \text{H} & \text{H} \\ & \\ \text{H}-\text{C}-\text{C}-\text{O}-\text{H} \\ & \\ \text{H} & \text{H} \end{array}$ <p>M2</p> $\begin{array}{c} \text{H} & & \text{O} \\ & & // \\ \text{H}-\text{C}-\text{C} & \text{O} & -\text{C}-\text{C}-\text{H} \\ & & & \\ \text{H} & & \text{H} & \text{H} \end{array}$	<p>If M1 and M2 not fully displayed/structural formulae, max 1 mark</p> <p>ALLOW both correct structural formulae scores max 1 mark</p>	2
(b)	not a closed system/not a sealed container OR open container	<p>ALLOW reactants/products could escape/evaporate</p> <p>ALLOW no acid catalyst / no H_2SO_4</p> <p>IGNORE reference to rate of reaction</p>	1
(c) (i)	<p>M1 provides an alternative pathway/route</p> <p>M2 with a lower activation energy</p>	<p>M2 dep on M1</p> <p>IGNORE lowers the activation energy</p>	2
(c) (ii)	<p>M1 the yield (of ethyl ethanoate) would not change</p> <p>M2 (the catalyst) increases the rate of the forward and backward reaction equally OWTTE</p>	<p>M2 dep on M1</p>	2
(d)	<p>an explanation linking any 5 of the following points:</p> <p>yield</p> <p>M1 (the forwards reaction is exothermic) therefore the backwards reaction is endothermic</p> <p>M2 the reaction moves backwards/shifts to left/reactants side to oppose the increase in temperature</p> <p>M3 (therefore) yield decreases</p> <p>rate</p> <p>M4 particles have more/increased (kinetic) energy</p> <p>M5 so more frequent successful collisions OR so more frequent collisions that have energy equal to/greater than activation energy</p> <p>M6 rate increases</p>	<p>M3 or M6 incorrect, max 4</p> <p>IGNORE favours endothermic change</p>	5
			Total 12

Question number	Answer	Notes	Marks
6 (a)	K_2SO_4	penalise incorrect letter cases and subscripts	1
(b)	thermometer	ALLOW digital thermometer/temperature probe	1
(c)	mass (of potassium sulfate)		1
(d)	barium sulfate is insoluble (in water)		1
(e) (i)	M1 12.5 (g) M2 $M1 \div 4 = 3.125$ or $3.1(3)$ (g)		2
(ii)	M1 17.5 (g) M2 $17.5 - 12.5$ M3 $(M1 - M2) \times 2 = 10(.0)$ (g)	ALLOW alternative method M1 $17.5 \times 2 = 35.0$ M2 $12.5 \times 2 = 25.0$ M3 $35 - 25 = 10(.0)$ (g)	3
			Total 9