



Mark Scheme (Results)

Summer 2026

Pearson Edexcel International GCSE in Chemistry

4CH1/2CR

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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.

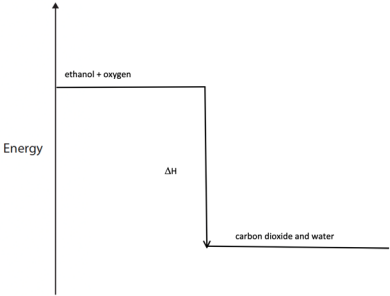
Question number	Answer	Notes	Marks
1 (a)	potassium	accept symbol	1
(b)	fractional distillation		1
(c) (i)	air		1
(ii)	gallium		1
(d)	<p>M1 (two) different elements</p> <p>M2 (chemically) joined/bonded together</p>	<p>ALLOW (two) different types of atoms</p> <p>REJECT ions for M1</p> <p>REJECT molecules scores 0</p>	2
			Total = 6

Question number	Answer	Notes	Marks
2 (a) (i)	A (electrons are free to move in the solid) B is not the correct answer as neutrons are not free to move in the solid C is not the correct answer as protons are not free to move in the solid D is not the correct answer as ions are not free to move in the solid		1
(ii)	M1 layers / rows (of atoms or ions) M2 can slide over one another	REJECT negative ions REJECT molecules REJECT electrons	2
(b) (i)	A (aluminium is more reactive than carbon) B is not the correct answer as carbon is not an oxidising agent C is not the correct answer as the reaction would have a very high activation energy D is not the correct answer as carbon and aluminium oxide do not react		1
(ii)	oxygen		1
(iii)	any one from: aluminium oxide has a high melting point aluminium oxide needs to be molten the process needs a lot of energy the process needs a lot of electricity	ACCEPT high temperature required	1
(c)	any one from: aluminium is unreactive aluminium has a low density aluminium is strong aluminium is non-toxic aluminium is corrosion resistant aluminium can be recycled	IGNORE high melting point REJECT will not rust	1
			Total = 7

Question number	Answer	Notes	Marks
3 (a)	(a solution that) has as much solute /solid /substance as possible dissolved (at a particular temperature)	ALLOW no more solute will dissolve REJECT 'reacts'	1
(b) (i)	47 (°C)	ALLOW 46-48 °C	1
(ii)	M1 47 - 40 M2 7.0 (g)	ALLOW ecf from M1 M2 dep on at least one correct value from M1 correct answer scores 2 marks	2
(c) (i)	measuring cylinder	ALLOW (volumetric) pipette / burette	1
(ii)	(to ensure) the boiling tube/water bath is evenly heated OR greater control over the heating		1
(iii)	M1 (6.2 ÷ 20) M2 (M1 x 100) AND correctly evaluated = 31 g per 100 g water	correct answer scores 2 marks	2
Total = 8			

Question number	Answer	Notes	Marks
4 (a)	(physical state at room temperature) solid (colour of halogen) black	ALLOW very dark grey	2
(b) (i)	M1 <u>atoms</u> with the same number of protons M2 and different numbers of neutrons	REJECT molecule/compound once only	2
(ii)	M1 ^{19}F is much more abundant (than ^{18}F) OWTTE M2 as the A_r is much closer to 19 than 18		2
(c) (i)	M1 mix the solutions (of chlorine and the solution of sodium bromide) M2 (the mixture of the two solutions) turns orange M3 because bromine is formed/produced	ALLOW any combination of orange / yellow / brown IGNORE other observations eg bubbles IGNORE state of bromine REJECT bromide IGNORE a displacement reaction occurs M3 can be scored by Br_2 as a product in an equation	3
(ii)	M1 atoms of chlorine are smaller / have fewer shells than atoms of bromine M2 there is therefore more attraction between the nucleus and the outer shell M3 therefore an electron is more easily gained/accepted	ALLOW reverse argument throughout ALLOW outer shell/electron is further from nucleus ALLOW less repulsion (from inner shells) or less shielding (from nuclear attraction)	3
Total = 12			

Question number	Answer	Notes	Marks
5 (a)	any two from: temperature of 30°C yeast absence of air/oxygen aqueous solution	ALLOW a range of 30-40°C ALLOW enzymes from yeast ALLOW anaerobic	2
(b) (i)	M1 $(52.8 - 19.5) = 33.3$ M2 $125 \times 4.2 \times 33.3$ M3 17482.5 J	Correct answer scores 3 ECF incorrect temperature ALLOW any number of significant figures other than 1	3
(ii)	M1 (conversion to kJ) = 19.5 kJ M2 amount propanol = $0.75 \div 60$ OR 0.0125 (mol) M3 -1560 kJ/mol	 Correct answer scores 3	3
(c) (i)	M1 more energy is given out when the bonds are made M2 than is taken in when the bonds are broken OR M1 breaking bonds is endothermic/takes in energy and making bonds is exothermic/releases energy M2 more energy is released than taken in	If state/imply that energy required to make bonds OR If state/imply that energy released when bonds are broken scores 0/2 ACCEPT correct reverse argument M2 dep on M1	2

(ii)	<p>M1 right-hand line below left-hand line</p> <p>M2 correct names/formulae of both reactants and products</p> <p>M3 ΔH correctly shown as a downward arrow and labelled (see diagram below)</p> 		3
Total = 13			

Question number	Answer	Notes	Marks
6 (a)	<p>M1 $44.7 \div 12 \quad 7.5 \div 1 \quad 47.8 \div 16$</p> <p>M2 (moles of each element) 3.725 7.5 2.99</p> <p>M3 (ratio) 1.25 : 2.5 : 1</p> <p>M4 $C_5H_{10}O_4$</p>	<p>0 marks for upside down calculation or use of atomic numbers</p> <p>Correct answer scores 4</p>	4
(b)	<p>M1 (amount of glucose in 5 cm^3) = $0.00510 \div 180$ OR 0.00002833 (mol)</p> <p>M2 (concentration of glucose) = 0.00566667 (mol/dm³)</p> <p>M3 0.00567 (mol/dm³)</p>	<p>ALLOW M1 $\times 200$</p> <p>ALLOW ecf from M2</p> <p>Correct answer scores 3</p>	3
(c)	<p>M1 (amount of CO_2) $7200 \div 24000$ OR 0.3 (mol)</p> <p>M2 amount of sugar B = 0.025 (mol)</p> <p>M3 $(8.55 \div 0.025) = 342$</p>	<p>ALLOW M1 $\div 12$</p> <p>28.5 scores 2</p> <p>Correct answer scores 3</p>	3
Total = 10			

Question number	Answer	Notes	Marks
7 (a) (i)	(the reaction is) reversible	ACCEPT reaction that goes both ways/both forwards and backwards reaction occur IGNORE references to equilibrium IGNORE references to reactants turning into products and products into reactants.	1
(ii)	M1 the forward and reverse reactions occur at the same/equal rate M2 the concentrations of reactants and products remain constant	ALLOW amounts REJECT concentrations of reactants and products are the same	2
(b) (i)	an explanation linking any 5 of the following: rate M1 rate increases M2 particles have increased (kinetic) energy / particles have energy (on average) greater than activation energy M3 so more frequent (successful) collisions/more (successful) collisions per unit time yield M4 the (forwards) reaction is exothermic OR the backwards reaction is endothermic M5 (increasing temperature) shifts the reaction in the endothermic direction M6 yield decreases	M6 dep on M4 or M5	5
(ii)	the rate of reaction would be too slow OWTTE		1

(c)	<p>a description including any 5 of the following points:</p> <p>M1 rinse/wash burette with sodium hydroxide (before filling)</p> <p>M2 use a (volumetric) pipette to add (25.0 cm³ of) nitric acid</p> <p>M3 rinse / wash the conical flask (with distilled or deionised water)</p> <p>M4 use a white tile (underneath the conical flask)</p> <p>M5 swirl the flask</p> <p>M6 (repeat) adding sodium hydroxide dropwise near the end point</p> <p>M7 record the volume of sodium hydroxide added (at the end point)</p> <p>M8 repeat until concordant results</p>	<p>ALLOW remove (air) bubbles (in the burette)</p> <p>REJECT if rinsed using acid for M3</p> <p>IGNORE stir</p> <p>IGNORE add dropwise (from the start)</p> <p>ALLOW results within 0.1-0.2 cm³ of one another</p>	5
Total = 14			