AQA Style

GCSE

COMBINED SCIENCE: TRILOGY

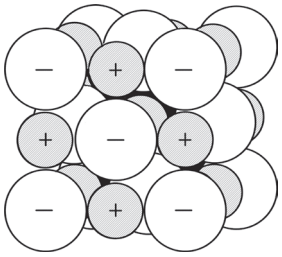
F

Foundation Tier Chemistry Paper 1

Mark Scheme

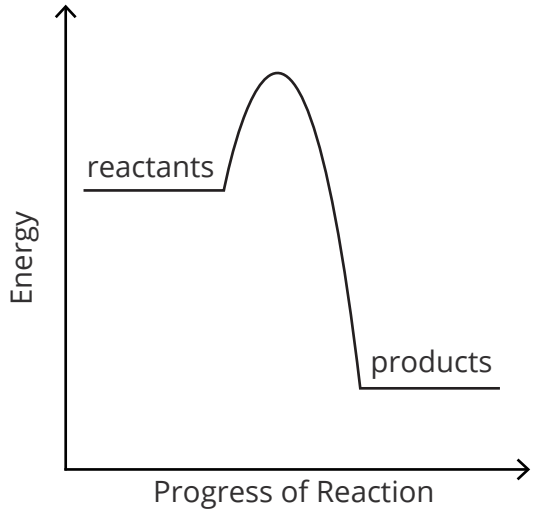
BEYOND SCIENCE

Question 1

Question	Answers	Extra information	Mark
01.1	alkali metals	If more than one box is ticked, award no marks.	1
01.2	Group 7	If more than one box is ticked, award no marks.	1
01.3	absence of electrons on sodium ion 7 crosses and 1 dot on chloride ion		1 1
01.4	ionic		1
01.5		If more than one box is ticked, award no marks.	1
01.6	electrostatic ions	Answers in this order only.	1 1
Total			**8**

Question 2

Question	Answers	Extra information	Mark
02.1	H^+	If more than one box is ticked award no marks. Accept H^+ written in the box in the equation.	1
02.2	dissolved in water	If more than one box is ticked award no marks.	1
02.3	**2**NaOH **2**H_2O		1 1
02.4	green		1
02.5	insulator		1
02.6	Any **one** from: • add a lid • use more than one polystyrene cup/ nested polystyrene cups • add insulation inside the beaker/ between the cup and the beaker		1

02.7	there is a curved line starting at the reactants line which goes up and then down the line for the products is lower than the line for the reactants  	Allow curve to start/ finish anywhere along reactant/ product lines. The products energy level does not need to be labelled, but it if is then the label must be correct.	1 1
Total			**9**

Question 3

Question	Answers	Extra information	Mark
03.1	2, 4		1
03.2	a shared pair of electrons in the overlap **or** on the intersection between each of the hydrogen atoms and the carbon atom	Electrons can be dots, crosses or e^- in any combination. Ignore any inner shell electrons on carbon. Do **not** allow inner shell electrons on the hydrogens. Do **not** accept if electrons are added to outer shells outside the overlap.	1
03.3	low boiling point weak intermolecular forces	If more than two boxes are ticked, subtract one mark for each incorrect box. Do **not** award less than zero marks.	1 1
03.4	each carbon atom forms four (covalent) bonds (with other carbon atoms) <u>covalent</u> bonds are strong	Allow giant structure. Accept lattice. Accept <u>covalent</u> bonds need a lot of energy to overcome/are difficult to break.	1 1

03.5	one electron from each carbon atom is delocalised electrons can move <u>through</u> the structure (and carry the current/charge/ electricity)	Allow graphite has delocalised/free electrons.	1 1
03.6	Any **one** from: • drug delivery • lubricants • catalysts • reinforcing composite materials • electronics	Allow any other suitable answer.	1
Total			**9**

Question 4

Question	Answers	Extra information	Mark
04.1	relative atomic masses: Mg = 24, C = 12, O =16		1
	24 + 12 + (16 × 3)	Allow 24 + 12 + 48	1
	M_r = 84	An answer of 84 with no working shown scores **3** marks.	1
04.2	magnesium chloride	Answers in either order.	1
	carbon dioxide		1
04.3	157 (g)		1
04.4	the gas/carbon dioxide is lost	Accept gas named in **02.2**.	1
	so the measurement/mass does not include all of the products/atoms		1
04.5	Any **three** from:		3
	• evaporate the water using a Bunsen burner/water bath/heat source		
	• until the crystallisation point is reached/ crystals start to form	Allow reference to crystallisation.	
	• leave in a cool place for at least 24 hours/overnight		
	• pat the crystals dry with a paper towel/ filter paper	Allow dry in an oven.	
Total			**11**

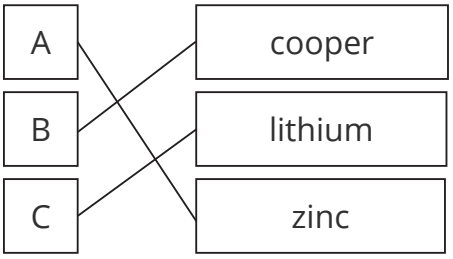
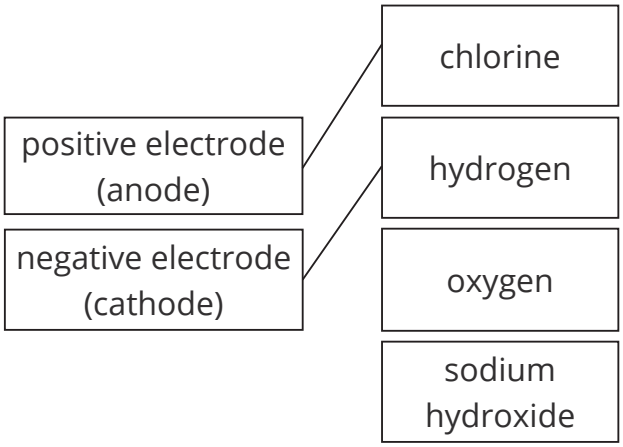
Question 5

Question	Answers	Extra information	Mark
05.1	gas	If more than one box is ticked, award no marks.	1
05.2	reactivity decreases as you go down the group	Allow converse argument throughout.	1
	the outer electrons are farther from the nucleus	Allow more energy levels/shells.	1
	less attraction between the outer electrons and the nucleus	Allow more shielding.	1
	(so) the electron is gained less easily		1
05.3	potassium chloride	Answers in either order.	1
	bromine		1
05.4	displacement (reaction)		1
05.5	no reaction		1
	because iodine is less reactive than bromine	Allow converse.	1
Total			**10**

Question 6

Question	Answers	Extra information	Mark
06.1	**Level 3:** There is a clear description of the difference between the two atomic models which is linked to an explanation of the evidence that caused the change in model.		5 – 6
	Level 2: There is a description of **both** atomic models **or** there is a description of one model **and** a description of the evidence from the alpha particle experiment.		3 – 4
	Level 1: There are simple statements that describe a model or the evidence from the alpha particle scattering experiment. Two marks can be given for two valid statements.		1 – 2
	No relevant content.		0
	Indicative content: **Plum Pudding Model** • a ball of positive charge • negative electrons embedded in it **Evidence** • alpha particle scattering experiment • mass of the atom is concentrated at the centre • the centre was charged **Nuclear Model** • positively charged nucleus • negatively charged electrons orbiting the outside		
06.2	6		1
06.3	same number of protons **or** same number of electrons	If numbers are quoted, they must be correct.	1
	different numbers of neutrons		1
06.4	$\frac{(20 \times 10) + (80 \times 11)}{100}$		1
	10.8		1
Total			**11**

Question 7

Question	Answers	Extra information	Mark
07.1		Award 2 marks for three correct lines. Award 1 mark for one or two correct lines. If more than one line is drawn from one box, award no marks for that box.	2
07.2	hydrogen		1
07.3	$\frac{100}{1000} = 0.1$ (dm^3) 0.1×300 30 (g)	Allow $\frac{300}{1000}$ (g/cm^3). Allow 100×0.3. If no other mark awarded, allow 30 000 for **1** mark.	1 1 1
07.4		If more than one line is drawn from one box, award no marks for that box.	2

07.5	aluminium oxide must be molten so that the ions can move to the electrodes		1
	the melting point of aluminium oxide is high so melting requires a lot of energy		1
	it is mixed with cryolite		1
	which reduces the temperature/energy required for the process/electrolysis		1
Total			**12**