AQA GCSE Chemistry

Practice answers

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	magnesium chloride hydrogen		1 1	AO2 4.4.2.1
01.2	hold a lit splint at the end of the test tube of gas (squeaky) pop sound		1 1	AO1 4.8.2.1
01.3	bubble through limewater turns cloudy		1 1	AO2 4.8.2.3
01.4	chlorine		1	AO2 4.8.2.4
02.1	chemically pure substances contain a single element or compound, not mixed with any other substance in everyday language, a pure substance can mean a substance that has had nothing added to it		1 1	
02.2	B and D	one mark for each correct answer	2	AO3 4.7.3.1 4.8.1.1
02.3	mixture of different chemicals each with a specific purpose that produces a useful product		1 1	AO2 4.8.1.2
03.1	aluminium		1	AO2 4.8.3.2
03.2	copper(II)		1	AO2 4.8.3.2

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03.3	calcium or magnesium/cannot identify	accept calcium or magnesium	1	AO2 4.8.3.2
03.4	sulfate		1	AO2 4.8.3.5
03.5	$CuSO_4(aq) + 2NaOH(aq) \rightarrow Na_2SO_4(aq) + Cu(OH)_2(s)$	one mark for reactants one mark for products one mark for state symbols accept correct balanced symbol equation that matches incorrect answers given in questions 03.2 and 03.4	3	AO2 4.8.3.2
04.1	$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$	one mark for reactants one mark for products	2	4.8.2.2
04.2	**Level 3:** All steps of the experiment are described correctly and in suitable detail. The writing is clear, coherent and logically organised.		5-6	AO1 4.8.1.3
	Level 2: Most steps of the experiment are described correctly, but the description may lack detail. The writing is mainly clear and coherent, but the order may not be logical.		3-4	
	Level 1: Some steps of the experiment are described correctly, but the description lacks detail. The writing lacks clarity and coherence. The order is not logical.		1-2	
	No relevant content.		0	

Question	Answers	Extra information	Mark	AO / Specification reference
	Indicative content • draw a line 0.5 cm from the bottom of a piece of chromatography paper • in pencil • chromatography paper is stationary phase • use a capillary tube • grind up the leaves using pestle and mortar • transfer small spot of the ground leaves to the pencil line • pour some solvent into a beaker • so that the level is below the pencil line • solvent is mobile phase • put chromatography paper into beaker • place a lid on the beaker • leave until solvent is one cm from the top of the paper • remove the chromatography paper from the beaker • mark and label the positions of the solvent front and spots on the paper			
04.3	chromatogram showing four spots in a vertical line		1	AO2 4.8.1.3
04.4	$R_f = \frac{\text{distance moved by substance}}{\text{distance moved by solvent}}$		1 1	AO1 4.8.1.3
04.5	xanthophyll		1	AO3 4.8.1.3

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Question	Answers	Extra information	Mark	AO / Specification reference
05.1	A: carbon dioxide B: oxygen C: hydrogen		1 1 1	AO2 4.8.2.1 4.8.2.2 4.8.2.3
05.2	damp litmus paper bleached		1 1	AO1 4.8.2.4
05.3	**Level 3:** A full method provided with names of equipment to use and steps needed to prepare and carry out the tests. Method shows clear process to identify compounds with minimal number of tests.		5-6	AO1 4.8.3.1 4.8.3.2 4.8.3.3 4.8.3.4
	Level 2: Method provided shows clear process to identify compounds with minimum number of tests. The tests and results are given, but an experimental procedure is not provided.		3-4	
	Level 1: Some tests to identify the various components of the compounds provided, but no attempt made to minimise the number of tests carried out. Tests and/or results are given, but no experimental procedure.		1-2	
	No relevant content.		0	

Question	Answers	Extra information	Mark	AO / Specification reference
	Indicative content identifying metal: • dissolve a sample of each compound in water • ensure (nichrome) wire is clear/dip in acid to clean • dip (nichrome) wire in first solution • hold wire in Bunsen burner • lithium will produce crimson flame • magnesium will not produce colour in flame **or** • dissolve a sample of each compound in water in a test tube • add sodium hydroxide solution • magnesium ions will form white precipitate • lithium ion does not form precipitate identifying non-metal ion: • take sample of one identified lithium compound • place in test tube • add named acid • place bung with delivery tube on immediately/quickly after adding acid • put delivery tube into another test tube • filled with limewater • carbonate compound will turn limewater cloudy • bromide compound will have no effect **or** • take a sample of one identified lithium compound • dissolve in some water in a test tube • add dilute nitric acid • add silver nitrate solution • bromide compound will form cream precipitate • carbonate compound will have no effect	acid must be named accept any strong acid		

Question	Answers	Extra information	Mark	AO / Specification reference
06.1	water		1	AO1 4.8.1.3
06.2	the ink spot is below the water the nk spot will mix with the water and not rise up the paper		1 1	AO3 4.8.1.3
06.3	**two** from: • A is a pure substance • B is a mixture of two substances • C is a mixture of three substances • A, B and C all include the same substance/the substance that has moved furthest up the paper • B contains two of the same substances as C • C contains one substance that is not present in any of the other substances	one mark for each correct answer up to a maximum of two points	2	AO3 4.8.1.3
06.4	$R_f = \frac{\text{distance moved by substance}}{\text{distance moved by solvent}}$ = 0.71		1 1	AO2 4.8.1.3
06.5	bottom spot in C circles its lowest spot has moved the shortest distance		1 1	AO3 4.8.1.3
07.1	nitric acid		1	AO1 4.8.3.1

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Question	Answers	Extra information	Mark	AO / Specification reference
07.2	copper carbonate solutions of copper(II) make a blue precipitate with sodium hydroxide carbonates make bubbles with dilute acids		1 1 1	AO3 4.8.3.2 4.8.3.3
07.3	filter the mixture		1	AO3
07.4	it forms a white precipitate with silver nitrate, so must be a chloride there is no change with sodium hydroxide solution, so it does not contain aluminium, calcium, magnesium, copper(II), iron(II) or iron(III) ions	 at least three of the metals ions it does not contain must be given	1 1	AO3
07.5	flame test		1	AO2 4.8.3.1
07.6	yellow – B is a sodium compound crimson – B is a lithium compound lilac – B is a potassium compound		1 1 1	AO2 4.8.3.1
08.1	arsenic and sodium	both names required for the mark	1	AO2 4.8.3.7
08.2	flame test – crimson add silver nitrate, acidified by nitric acid a cream precipitate will form		1 1 1	AO1 4.8.3.1 4.8.3.4
08.3	**two** from: • more accurate • quicker • more sensitive	one mark for each correct answer, up to a maximum of two marks	2	AO1 4.8.3.6

Question	Answers	Extra information	Mark	AO / Specification reference
09.1	a mixture that has been designed as a useful product		1	AO1 4.8.1.2
09.2	$\frac{20}{20+70+11} \times 100\%$ **or** $\frac{20}{200} \times 100\%$ = 10%	award two marks if answer is correct with no working shown	1 1	AO2 4.8.1.2
09.3	C_7H_{16}		1	AO2 4.7.1.1
09.4	ethanol is renewable/can be obtained sustainably		1	AO1 4.10.1.1
10.1	copper		1	AO1 4.8.3.1
10.2	barium		1	AO3 4.8.3.1
10.3	barium gives same flame colour as copper		1	AO3 4.8.3.1
10.4	chloride		1	AO2 4.8.3.4
11.1	add acid carbonate produces carbon dioxide gas nitrate has no reaction		1 1 1	AO2 4.8.3.3

Question	Answers	Extra information	Mark	AO / Specification reference
11.2	add dilute nitric acid and silver nitrate solution white precipitate with chloride yellow precipitate with iodide		1 1 1	AO2 4.8.3.4
11.3	flame test calcium chloride gives red flame magnesium chloride gives no colour		1 1 1	AO2 4.8.3.1
11.4	add sodium hydroxide solution green precipitate iron(II) sulfate brown precipitate iron(III) sulfate		1 1 1	AO2 4.8.3.2
12.1	use of sulfuric acid in test for carbonate will give positive result in test for sulfate use of barium chloride in test for sulfate will give positive in test for halides		1 1	AO3 4.8.3.4 4.8.3.5
12.2	carry out halide test, then sulfate test, then carbonate test	do not accept carry out tests in separate test tubes	1	AO3 4.8.3.3 4.8.3.4 4.8.3.5
12.3	use nitric acid in test for carbonate		1	AO3 4.8.3.3
12.4	$Al_2(CO_3)_3(aq) + 3H_2SO_4(aq) \rightarrow Al_2(SO_4)_3(aq) + 3H_2O(l) + 3CO_2(g)$	one mark for reactants one mark for products one mark for state symbols	3	AO2 4.4.2.2
13.1	$C_{19}H_{40} \rightarrow C_8H_{20} + C_5H_{10} + C_6H_{10}$		1	AO1 4.7.1.4

Question	Answers	Extra information	Mark	AO / Specification reference
13.2	alkane		1	AO1 4.7.1.1
13.3	C_8H_{20}		1	AO1 4.7.1.1
13.4	C_6H_{10}		1	AO1 4.7.2.1
13.5	extra carbon atom added two C=C double bonds included hydrogens added so that all carbon atoms only have four bonds	position of double bonds does not matter	1 1 1	AO2 4.7.2.1
13.6	high temperature and catalyst		1	4.7.1.4
14.1	propene		1	AO2 4.7.2.1
14.2	alcohols		1	AO2 4.7.2.3
14.3	mass of 1 mole of C = (3 × 12) + (6 × 1) + (16 × 2) = 74 g number of moles of water = $\frac{\text{mass}}{\text{mass of 1 mole}}$ $= \frac{10.0}{74} = 0.14$		1 1 1	AO2 4.3.2.1
14.4	**Level 3:** The comparisons are detailed and accurate. The writing is clear, coherent and logical and comparisons are clearly made.		5-6	AO1

Question	Answers	Extra information	Mark	AO / Specification reference
	Level 2: The comparisons are generally correct, although may lack detail. The writing is mainly clear, although the structure may lack logic and comparisons are not always clear.		3-4	4.7.2.3 4.7.2.4
	Level 1: Some comparisons are correct. The writing lacks clarity, coherence and logic, and the comparisons are not clearly expressed.		1-2	
	No relevant content.		0	
	Indicative content • both burn to make carbon dioxide and water • on burning, both release energy/transfer energy to the surroundings • C bubbles with carbonates to make carbon dioxide, D does not • C reacts with alcohols to make esters but D reacts with carboxylic acids to make esters • both dissolve in water • D is oxidised by oxidising agents (such as potassium dichromate(VI)) but C is not oxidised • C is acidic, D is neutral • both will react with Na to form H_2			