AQA GCSE Chemistry

Practice answers

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	water that is safe to drink		1	AO1 4.10.1.2
01.2	passing water through filter beds – to remove pieces of solid sterilising – to kill microorganisms desalination – to remove dissolved salts	award one mark for one or two correct; award two marks for all three correct	2	AO1 4.10.1.2
01.3	**two** from: • chlorine • ozone • ultraviolet light	one mark for each correct answer up to two marks	2	AO1 4.10.1.2
01.4	advantage – water can be obtained from seawater if supplies of freshwater are limited disadvantage – large amount of energy required		1 1	AO1 4.10.1.2
02.1	crushing and melting the jar to make a bottle		1	4.10.2.2
02.2	SiO_2 $CaCO_3$ sodium carbonate		1 1 1	AO2 4.1.1.1
02.3	reduced use of raw materials reduced use of energy reduced waste		1 1 1	AO1 4.10.2.2
03.1	use a pipette instead of a measuring cylinder to measure the volume of water more accurately		1 1	AO3 4.10.1.2

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03.2	heat until some of water has evaporated, then leave in a dry place for the rest of the water to evaporate evaporating basin less likely to break		1 1	AO3 4.10.1.2
03.3	wear eye protection do not touch hot apparatus		1 1	AO3 4.10.1.2
03.4	A		1	AO3 4.10.1.2
03.5	C greater mass of dissolved solids		1 1	AO3 4.10.1.2
04.1	Bunsen burner reaches high enough temperature (to make the water boil) (water bath does not)		1	AO2 4.10.1.2
04.2	so that there are no gaps between the test tube and the cooling system		1	AO3 4.10.1.2
04.3	no bung in the top of the flask		1	AO3 4.10.1.2
04.4	pure water leaves the seawater as steam so concentration of salt increases		1 1	AO2 4.10.1.2
05.1	grow plants on the low-grade ore harvest and burn the plants add sulfuric acid to the ash displace copper from the copper sulfate solution by adding scrap iron/use electrolysis		1 1 1 1	AO1 4.10.1.4

Question	Answers	Extra information	Mark	AO / Specification reference
05.2	**Level 3:** The comparisons are detailed and accurate. The writing is clear, coherent and logical and comparisons are clearly made.		5-6	AO1 × 3 AO3 × 3 4.10.1.4 4.10.2.2
	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	
	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
	• scrap copper advantages
	  ○ uses copper waste, preventing its need to be disposed of in other ways
	• scrap copper disadvantages
	  ○ cannot be obtained from mixtures containing very small amounts of copper
	  ○ copper must be separated from other materials it is mixed with
	• bioleaching advantages
	  ○ copper can be obtained from lower-grade ores
	• bioleaching advantages
	  ○ slow			

Question	Answers	Extra information	Mark	AO / Specification reference
05.3	$\frac{22.1}{100} \times m = 50$ kg where m is the mass of ore mined $m = 226$ kg waste = 226 – 50 = 176 kg		1 1 1 1	AO2 4.10.1.1
06.1	**Level 3:** The comparisons are detailed and accurate. The writing is clear, coherent and logical and comparisons are clearly made. A conclusion about which is better is clearly made and justified in detail.		5-6	AO3 4.10.2.1
	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. A conclusion about which is better is given, but not justified.		3-4	
	Level 1: Some comparisons are correct. The writing lacks clarity, coherence and logic, and the comparisons are not clearly expressed. No conclusion is given about which is better.		1-2	
	No relevant content		0	

Question	Answers	Extra information	Mark	AO / Specification reference

	Indicative content:
	• PLA advantages
	  ○ lower energy requirements
	  ○ smaller amounts of greenhouse gases produced
	  ○ biodegradable
	• PLA disadvantages
	  ○ requires more land
	  ○ pollutes soil more
	  ○ not recyclable
	• PET advantages
	  ○ requires less land
	  ○ pollutes soil less
	  ○ recyclable
	• PET disadvantages
	  ○ higher energy requirements
	  ○ greater amounts of greenhouse gases produced
	  ○ not biodegradable			

06.2	$\frac{0.0565}{12}$ = 0.0 047 083 = 4.71×10^{-3} m^2		1 1 1	AO2

Question	Answers	Extra information	Mark	AO / Specification reference
06.3	energy required lower for recycled PET **one** from: • raw materials/oil does not need to be sources • reshaping PET required less energy than making PET from raw materials • shorter process • less transportation costs as recycling can be carried out locally/raw materials don't have to be transported	accept any sensible answer	1 1	AO3 4.10.2.1
07.1	2,3,4	all three required for the mark	1	AO3 4.10.2.1
07.2	extracting and processing raw materials: 1 manufacturing and packaging: 2/3/4 use and operation during its lifetime: 6 disposal at the end of life: 7		1 1 1 1	AO1 AO3 4.10.2.1
07.3	energy to heat water used for washing		1	AO3 4.10.2.1
07.4	recycle/give to someone else/use for rags		1	AO3 4.10.2.2
08.1	organic matter harmful microbes		1 1	AO1 4.10.1.3

Question	Answers	Extra information	Mark	AO / Specification reference
08.2	screening and grit removal sedimentation to make sewage sludge and effluent anaerobic digestion of sludge aerobic biological treatment of effluent		1 1 1 1	AO1 4.10.1.3
08.3	groundwater has smaller amounts of impurities in it/groundwater contains less organic matter and harmful microbes		1	AO1 4.10.1.3
09.1	760	allow any answer between 755 and 765	1	AO2 4.10.1.3
09.2	$\frac{45}{760} \times 100$ = 6%		1 1	AO2 4.10.1.1
09.3	mass of $Ta_2O_5 = \frac{80}{100}$ x 72 = 57.6 kg mass of Ta in 57.6 kg of Ta_2O_5 = $\frac{(2 \times 181)}{(2 \times 181) + (5 \times 16)}$ × 57.6 = 47 kg		1 1 1	AO2 4.10.1.1
09.4	$\frac{1.5 \times 10^5}{760}$ = 197	accept 200	1 1	AO2 4.10.1.1

Question	Answers	Extra information	Mark	AO / Specification reference
09.5	**two** from: • more tantalum ore might have been found • less tantalum might have been extracted each year • new technology might enable tantalum to be extracted from ores from which it was not previously economic to extract the metal • demand for tantalum may increase/decrease • more tantalum recycled	one mark for each correct answer up to two marks	2	AO3 4.10.1.1
10.1	development that meets the needs of current generations without compromising the ability of future generations to meet their own needs		1	AO1 4.10.1.1
10.2	wood is renewable wood is biodegradable		1 1	AO3 4.10.1.1
10.3	less land is required for plastic production		1	AO3 4.10.1.1
11.1	alkanes		1	AO1 4.7.1.1
11.2	C_9H_{20}		1	AO2 4.7.1.1
11.3	butane		1	AO1 4.7.1.1
11.4	no change/remain orange		1	AO2 4.7.1.3

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Question	Answers	Extra information	Mark	AO / Specification reference
11.5	$C_4H_{10}(g) + 6.5O_2(g) \rightarrow 4CO_2(g) + 6H_2O(g)$		3	AO2 4.7.1.3
11.6	temperature of 550 °C catalyst		1 1	AO1
11.7	1 C atom and 4 H atoms are drawn each H atom shares 1 dot and 1 cross with C atom		2	AO1 4.2.1.4
11.8	shorter-wave radiation from the Sun penetrates the atmosphere the Earth's surface emits longer-wavelength radiation greenhouse gases absorb some of the longer-wavelength radiation so trapping some of the radiation within the atmosphere		1 1 1 1	AO1 4.9.2.1
12.1	bubbling through limewater		1	AO1 4.8.2.3
12.2	sulfate		1	AO2 4.8.3.5
12.3	mixture of metals/metal does not produce result in flame test		1	AO2 4.8.3.1

Question	Answers	Extra information	Mark	AO / Specification reference
12.4	**three** from: • more accurate • more sensitive • can detect multiple metal ions • can measure concentrations of ions	one mark for each correct answer up to three marks do not accept more rapid	1 1 1 1 1	AO1 4.8.3.6 4.8.3.7
12.5	zinc lithium		1 1	AO3 4.8.3.7
13.1	12 C atoms, 2 N atoms, 2 O atoms and 2 H atoms are drawn one C atom is joined to 1 O atom by = and is joined to a C atom by –one 8 C atoms are joined to 2 C atoms by – one C atom is joined to 1 C atom and 1 N atom by – and joined to a C atom by = 2 N atoms are joined to 2 C atoms and 1 H atom by – one C atom is joined to 1 N atom and 1 C atom by – all atoms are inside square brackets with a – extending outside the brackets subscript n to the right of the bracket		2	AO2 4.7.3.2
13.2	condensation (polymerisation)		1	AO2 4.7.3.2

Question	Answers	Extra information	Mark	AO / Specification reference
13.3	HCl/hydrogen chloride		1	AO2 4.7.3.2
14.1	carbon dioxide		1	AO1 4.9.1.2
14.2	water vapour/methane/ammonia		1	AO1 4.9.1.2
14.3	carbon dioxide		1	AO1 4.9.2.1
14.4	no some greenhouse gases in the atmosphere are needed to maintain the temperatures that support life on Earth		1 1	AO1 4.9.2.1