AQA GCSE Chemistry

Practice answers

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	12 + (4 × 1) = 16		1	AO2 4.3.1.2
01.2	the reactant that is completely used up when the other reactant is present in excess		1	AO1 4.3.2.1
01.3	$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$		2	AO2 4.3.1.1
01.4	oxygen		1	AO2 4.3.2.4
01.5	0.25		1	AO2 4.3.2.4
02.1	$6.02 \times 10^{23} \times 6$ $= 3.61 \times 10^{24}$		1 1	AO1 4.3.2.1
02.2	164		1	AO2 4.3.1.2
02.3	gaseous products leave the test tube as a gas	allow named gas (oxygen or nitrogen dioxide).	1	AO2 4.3.1.3

Question	Answers	Extra information	Mark	AO / Specification reference
02.4	CaO: (40 + 16) = 56 $\frac{22.4}{56}$ = 0.4 mol 0.4 x 164 = 65.6g 6.02 x 10^{23}		1 1 1 1 1	AO1x1 AO2x4 4.3.2.2
03.1	mass of one mole of water = RMM of H_2O = 16 + (2 x 1) = 18 answer states for water, 1 g = 1 cm^3, so 1 mole = 18 g = 18 cm^3		1 1	AO2 4.3.2.1
03.2	$\frac{18}{6.02 \times 10^{23}}$ = 2.99×10^{-23} g		1 1	AO2 4.3.2.1
03.3	answer assumes that all particles in the 18 cm^3 is taken up by water particles but water is a liquid, so has space between the particles		1 1	AO3 4.3.2.1
04.1	there are three atoms of oxygen for every one atom of sulfur		1	AO2 4.1.1.1
04.2	32 + (2 x 16) = 64	accept correct answer without working shown	1	AO2 4.3.1.2
04.3	1.68 - 1.28 = 0.4 g	accept correct answer without working shown	1 1	AO1 4.3.1.1

AQA GCSE Chemistry

Practice answers

Question	Answers	Extra information	Mark	AO / Specification reference
05.1	the number of atoms, molecules or ions in a mole of a given substance	accept 'particles' in place of 'atoms', 'molecules' or 'ions' accept mention of just one or two of atoms, molecules or ions.	1	AO1 4.3.2.1
05.2	M_r of water = (2 x 1) + 16 = 18 number of moles of water = $\frac{23}{18}$ = 12.89 mol number of molecules = 12.89 x 6.02×10^{23} = 7.76×10^{24}		1 1 1 1 1	AO2 4.3.2.1
05.3	$\frac{464}{232} = 2$ 2 x $7.76 \times 10^{24} = 1.55 \times 10^{25}$		1 1	AO2 4.3.2.1
06.1	one from • wear eye protection • work in a fume cupboard	accept any other reasonable answer.	1	AO3 WS2.4
06.2	$2Na(s) + Cl_2(g) \rightarrow 2NaCl(s)$	one mark for balancing one mark for state symbols	2	AO2 4.3.1.1 4.2.2.2
06.3	**Level 3:** The description is detailed and accurate. The writing is clear, coherent and logical.		5-6	AO1 4.2.1.2 4.2.1.3
	Level 2: The description is correct, although lacks detail. The writing is mainly clear, although the structure may lack logic.		3-4	

Question	Answers	Extra information	Mark	AO / Specification reference
	Level 1: Some aspects of the description are correct. The writing lacks clarity, coherence and logic.		1-2	
	No relevant content.		0	
	Indicative content • sodium atoms each lose one electron to make Na^+ ions. • chlorine atoms each gain one electron to make Cl^- ions. • the oppositely charged ions are held together • in a lattice • by strong electrostatic forces of attraction • that act in all directions.			
07.1	$\frac{52+49+48+56+55}{5} = 52$		1	AO2 MS2b
07.2	56 - 48 = 8		1	AO2 4.3.1.4
07.3	uncertainty = $\frac{\text{range}}{2} = \frac{8}{2} = 4$ mean ± 4		1	AO2 4.1.3.4
07.4	$7.3 \times \frac{25}{1000}$ = 0.1825 = 0.18		1 1 1	AO2 4.3.2.5

Question	Answers	Extra information	Mark	AO / Specification reference
08.1	$HNO_3(aq) + KOH(aq) \longrightarrow KNO_3(aq) + H_2O(l)$		1	AO2 4.2.2.2
08.2	$\frac{14}{700} \times 1000$ $= 20\ g/dm^3$	allow 0.02 g/cm^3 if units are specified.	1 1	AO2 4.3.2.5
08.3	$22 \times \frac{30}{1000}$ $= 0.66\ g$		1 1	AO2 4.3.2.5
08.4	moles $HNO_3 = \frac{0.66}{63}$ $= 0.01$ $20 \times \frac{35}{1000} = 0.7\ g$ moles $KOH = \frac{0.7}{56}$ $= 0.0125$ since moles HNO_3 < moles KOH, limiting reagent = HNO_3		1 1 1 1 1 1	AO2 4.3.2.5

Question	Answers	Extra information	Mark	AO / Specification reference
09.1	first N atom should have 2 shells with 2 crosses in first shell and 5 crosses in second shell, second N atom should be the same but with dots. the N atoms should be sharing 3 dot and 3 cross electrons in an alternating pattern.		2	AO2 4.2.1.4
09.2	gas would build up in the tube, as it has nowhere to escape to this may result in the bung being forced out of the test tube		1 1	AO3 WS2.3 WS2.4
09.3	number of moles of Mg = $\frac{2.16}{24} = 0.09$ number of moles of $N_2 = \frac{0.84}{(2 \times 14)} = 0.03$ number of moles of $Mg_3N_2 = \frac{3.00}{(3 \times 24)+(2 \times 14)} = 0.03$ $0.09\ Mg + 0.03\ N_2 \rightarrow 0.03\ Mg_3N_2$ $3\ Mg + N_2 \rightarrow Mg_3N_2$		1 1 1 1 1	AO2×3 AO3×2 4.3.2.3
10.1	$1\ dm^3 = 1000\ cm^3$, so $\frac{1000 cm^3}{5 cm^3} = 200$ 500 mg x 5 = 2500 mg in $1\ dm^3$ $0.5 g/dm^3$		1 1 1	AO2 WS4.3 WS4.4 WS4.5 4.3.2.5

AQA GCSE Chemistry

Practice answers

Question	Answers	Extra information	Mark	AO / Specification reference
10.2	(8 x 12) + (9 x 1) + 14 + (2 x 16) = 151 g		1	AO2 4.3.1.2
10.3	M_r of ibuprofen = (13 x 12) + (18 x 1) + (2 x 16) = 206 number of moles in 5.0 cm^3 of solution = $\frac{0.1}{206}$ = 0.000 485 number of moles in 1000 cm^3 of solution = 0.000 485 x 200 = 0.0971 moles	or 9.71×10^{-2} mol in standard form final mark awarded for giving answer to 3 significant figures	1 1 1 1	AO2 4.3.2.1 4.3.2.5 MS2a
11.1	(4 x 12) + (2 x 1) + 56 + (4 x 16) = 170		1	AO2 4.3.1.2
11.2	M_r = 56 + 32 + (4 x 16) = 152 number of moles = $\frac{0.1}{206}$ = 4.3 $\times 10^{-4}$ moles	one mark awarded for giving answer to two significant figures; one mark for correctly expressing answer in standard form	1 1 2	AO2 4.3.2.1 MS1b
11.3	M_r = (12 x 12) + (24 x 1) + 56 + (14 x 16) = 448 number of moles of iron gluconate = $\frac{0.3}{448}$ = 0.000 670 number of moles of iron = 0.000 670 mass of iron = 0.000 670 x 56 = 0.0375 g	or 37.5 mg if correct units are given	1 1 1 1	AO2×2 AO3×2 4.3.2.1 MS2a

Question	Answers	Extra information	Mark	AO / Specification reference
12.1	M_r of iron oxide = (56 x 2) + (3 x 16) = 160 16 g = $\frac{16}{160}$ = 0.10 mol 0.10 moles of Fe_2O_3 reacts with 0.15 moles of C 12 x 0.15 = 1.8 g		1 1 1 1 1	AO2 4.3.2.2
12.2	number of moles of CO_2 = number of moles of C = 0.15 M_r of CO_2 = 12 + (2 x 16) = 44 g mass of CO_2 = 0.15 x 44 g = 6.6 g		1 1 1 1	AO2 4.3.2.2
12.3	3.7 tonnes = 3700 kg $\frac{3700}{160}$ = 23.125 moles 23.125 x 2 = 46.25 moles of Fe 46.25 x 56 = 2590 kg		1 1 1 1 1 1	AO2 4.3.2.2
12.4	$\frac{2590}{3700}$ x 100 = 70%	allow 56 x $\frac{2}{160}$ x 100	1 1	AO2

Question	Answers	Extra information	Mark	AO / Specification reference
13.1	wear eye protection work in a fume cupboard		1 1	AO1 WS2.4
13.2	fill the gas jar with chlorine gas first so that the chlorine does not escape before the sodium is added to it		1 1	AO3 WS2.4
13.3	Na ion should have 2 shells with 2 crosses in the first shell, 8 crosses in second shell. Should be in square brackets with a superscript '+' to the right of the brackets. Cl ion should have 3 shells with 2 dots in the first shell, 8 dots in the second shell and 7 dots and 1 cross in square brackets. Should be in square brackets with a superscript '+' to the right of the brackets.		2	AO1 4.2.1.2
	three from: • ionic bonding • sodium atom transfers 1 electron to chlorine atom • forming 1+ sodium ion and -1 chlorine ion • electrostatic attraction between oppositely charged ions	one mark for each correct point	3	AO1 4.2.1.2

AQA GCSE Chemistry

Practice answers

Question	Answers	Extra information	Mark	AO / Specification reference
13.5	sodium conducts electricity because it contains delocalised electrons that can move chlorine does not conduct electricity because it does not contain charged particles that can move sodium chloride conducts electricity when in solution or molten, but not when solid because ions are free to move		1 1 1 1 1 1	AO1 4.2.1.3 4.2.1.4 4.2.1.5
13.6	at the start, orange-brown liquid instead of green gas during/reaction would be less vigorous		1	AO1 4.1.2.6
14.1	P atom should have 3 shells, first shell should have 2 crosses, second shell should have 8 crosses and 3 shell should have 5 crosses		1	AO1 4.1.1.7
14.2	five		1	AO3 4.1.2.1
14.3	**Level 3:** The properties and locations are correctly given. The comparisons are clear, coherent and logically expressed.		5-6	AO1 4.1.1.5 4.1.1.4
	Level 2: The properties and locations are mainly correct. The comparisons are mainly clear, but there is a lack of logic in the answer.		3-4	
	Level 1: Some of properties and/or locations are correct. The writing lacks clarity, coherence and logic, and only one or two comparisons are made.		1-2	

Question	Answers	Extra information	Mark	AO / Specification reference
	No relevant content.		0	
	Indicative content • protons have a charge of +1 and a relative mass of 1 • neutrons have no charge and a relative mass of 1 • electrons have a charge of −1 and a very small relative mass • protons and neutrons are found in the nucleus of an atom • electrons are found outside the nucleus • electrons are in orbits/shells/levels			