

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	six water molecules react with six carbon dioxide molecules		1	AO1 5.3.1.1
01.2	(l) (g)		1 1	AO1 5.2.2.2
01.3	18		1	AO2 5.3.1.1
01.4	the same no conservation		1 1 1	AO1 5.3.1.1
02.1	$2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$	one mark for balancing one mark for oxygen one mark for state symbol	3	AO1 AO2 5.2.2.2 5.3.1.1
02.2	oxygen atoms bond with the magnesium atoms to form solid magnesium oxide so the product/magnesium oxide has more particles/more matter than starting magnesium/oxygen has mass so heavier		1 1	AO2 5.3.1.3
02.3	Mg ion and O ion are drawn with 1 shell each. Mg ion has 8 dot and is inside square brackets with a superscript 2+ to the right of the bracket O ion is drawn with 6 crosses and 2 dots and is inside square brackets with a superscript 2- to the right of the bracket	one mark for magnesium electron structure one mark for oxygen electron structure one mark for charges	3	AO2 5.2.1.2

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03.1	$2\text{Li} + 2\text{HCl} \rightarrow 2\text{LiCl} + \text{H}_2$		2	AO2 5.3.1.1
03.2	LiCl(aq)		1	AO2 5.2.2.2
03.3	hydrogen chloride		1	AO1 5.3.2.5
03.4	$500 \text{ cm}^3 = 0.5 \text{ dm}^3$ $\frac{7.3}{0.5}$ $= 14.6 \text{ g/dm}^3$	error carried forward	1 1 1	AO1 AO2 5.3.2.5
03.4	mass decreases because gas produced that escapes from the reaction flask		1 1	AO2 AO3 5.3.1.3
04.1	$\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$		1	AO2 5.3.1.1
04.2	$3.25 + 3.65 = 6.9 \text{ g}$		1	AO1 5.3.1.1
04.3	$(1 \times 2) + 32 + (16 \times 4)$ $= 98$		1 1	AO1 AO2 5.3.1.2
05.1	50 cm^3		1	AO2
05.2	48 to 56		1	AO3 5.3.1.4

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05.3	mean \pm 4		1	AO3 5.3.1.4
06.1	three oxygen atoms		1	AO2 5.3.1.1
06.2	$32 + (16 \times 2) = 64$		1	AO1 5.3.1.2
06.3	$1.62 - 1.28 = 0.34$ g		1	AO2 5.3.1.1
07.1	(aq) – aqueous – 2nd image (g) – gas – 3rd image (s) – solid – 1st image (l) - liquid – 3rd image	one mark for one correct two marks for two correct three marks for all correct	3	AO1 5.2.2.2
07.2	(s) + (aq) \rightarrow (g) + (aq)	one mark for two correct two marks for all correct	2	AO2 5.2.2.2
07.3	95		1	AO1 5.3.1.2
07.4	$19 \times 0.5 = 9.5$ g		1	AO1 5.3.2.5
07.5	decreased gas		1 1	AO1 AO2 5.3.1.3

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08.1	decreased gas		1	AO1 5.1.1.5
08.2	25 protons 30 neutrons		1 1	AO1 AO2 5.3.1.2
08.3	ionic		1	AO2 5.1.2.5
09.1	14		1	AO3 5.3.1.4
09.2	$14 \text{ cm}^3 = 0.014 \text{ dm}^3$ 10×0.014 $= 0.14 \text{ g}$		1 1 1	AO2 5.3.2.5
09.3	10 cm^3 closest to volume being measured most accurate		1 1 1	AO3 5.3.1.4
10.1	one from: <ul style="list-style-type: none"> wear eye protection work in a fume cupboard 	accept any other reasonable answer	1	AO3 5.1.2.5
10.2	$2\text{Na} + \text{Cl}_2 \rightarrow 2\text{NaCl}$	one mark for products one mark for reactants	1 1	AO2 5.3.1.1
10.3	a solid substance that dissolved in a liquid		1	AO1 5.3.2.5

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10.4	$450 \text{ cm}^3 = 0.45 \text{ dm}^3$ 29.3×0.45 $= 13.14 \text{ g}$		1 1 1	AO1 AO2 5.3.2.5
10.5	+/- 0.01		1	AO3 5.3.1.4
10.6	Level 3: The description is detailed and accurate. The writing is clear, coherent and logical.		5-6	AO1 5.2.1.2 5.2.1.3
	Level 2: The description is correct, although lacks detail. The writing is mainly clear, although the structure may lack logic.		3-4	
	Level 1: Some aspects of the description are correct. The writing lacks clarity, coherence and logic.		1-2	
	No relevant content.		0	
	Indicative content:			
	<ul style="list-style-type: none"> 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 (giant ionic) lattice by strong electrostatic forces of attraction that act in all directions credit correct dot and cross diagrams 			