

Paper 2 (4SS0/1C)

Question number	Answer	Additional guidance	Mark
1(a)(i)	An explanation that makes reference to the following two points: - boxes 1 and 2 (1) - because they both have only one type of atom/molecule (1)	accept other indications, e.g. only He and only H-H accept species in place of atom/molecule second mark can be awarded if only box 1 or box 2 identified	2

Question number	Answer	Additional guidance	Mark
1(a)(ii)	An explanation that makes reference to the following two points: - boxes 3 and 5 (1) - box 3 contains a mixture of helium and hydrogen and box 5 contains a mixture of hydrogen and water (1)	second mark can be awarded if only box 3 or box 5 identified	2

Question number	Answer	Mark
1(b)(i)	Simple distillation	1

Question number	Answer	Mark
1(b)(ii)	Chromatography	1

Question number	Answer	Mark
1(b)(iii)	Crystallisation	1

Total for Question 1 = 7 marks

Question number	Answer	Additional guidance	Mark
2(a)	• (Ammonia) blue (1) • (Chlorine) white/colourless (1)	ignore red accept bleached	2

Question number	Answer	Mark
2(b)	A description that makes reference to the following two points: • (hydrogen) burning splint gives a squeaky pop (1) • (oxygen) glowing splint relights (1)	2

Question number	Answer	Mark
2(c)	A description that makes reference to the following four points: • dip platinum wire in acid (1) • then into sodium chloride (1) • then into Bunsen flame (1) • yellow colour with sodium ion (1)	4

Total for Question 2 = 8 marks

Question number	Answer	Additional guidance	Mark
3(a)(i)	A description that makes reference to any two of the following points: • sodium floats/moves across the water (1) • sodium melts/forms a ball (1) • sodium disappears/gets smaller (1) • effervescence/fizzing/bubbles/gas given off (1) • white trail (1)	accept sodium dissolves ignore name of gas	2

Question number	Answer	Additional guidance	Mark
3(a)(ii)	An explanation that makes reference to the following two points: • (final colour is) purple/blue (1) • because the solution is alkaline (1)	accept sodium hydroxide forms/solution has high pH	2

Question number	Answer	Mark
3(a)(iii)	D	1

Question number	Answer	Additional guidance	Mark
3(b)	Potassium catches fire	accept lilac/purple/violet flame	1

Question number	Answer	Additional guidance	Mark
3(c)	$2\text{Rb} + 2\text{H}_2\text{O} \rightarrow 2\text{RbOH} + \text{H}_2$ (1)	accept multiples and fractions	1

Total for Question 3 = 7 marks

Question number	Answer	Additional guidance	Mark
4(a)	Equal numbers of + and – charges/equal numbers of protons and electrons	accept 5 in place of equal	1

Question number	Answer	Mark
4(b)	An explanation that makes reference to the following two points: • same number of protons (1) • different numbers of neutrons (1)	2

Question number	Answer	Mark
4(c)	• (Atom 1 mass number) 10 (1) • (Atom 2 atomic number) 5 (1)	2

Question number	Answer	Mark
4(d)	• Setting out of calculation • Evaluation $((6 \times 7.0) + (7 \times 93.0) \div 100) (1)$ $= 6.9 (1)$	2

Total for Question 4 =7 marks

Question number	Answer	Mark
5(a)	X and Z (1)	1

Question number	Answer	Mark
5(b)	An explanation that makes reference to the following points: • X has a higher melting point than Z (1) • because covalent bonds need to be broken in X (1) • but intermolecular forces (between molecules) need to be overcome in Z (1) • covalent bonds/bonds in X are strong and intermolecular forces/forces in Z are weak (1)	4

Question number	Answer	Mark
5(c)	An explanation that makes reference to any two linked of the following points: • oppositely charged ions (1) • are strongly attracted to each other (1) • so lot of energy needed to overcome the (strong forces of attraction) (1)	2

Total for Question 5 = 7 marks

Question number	Answer	Additional guidance	Mark
6(a)	35 (1) 41 (1)	final answer consequential on syringe readings	2

Question number	Answer	Additional guidance	Mark
6(b)	- Calculation of volume of oxygen used - Calculation of original volume of air - Calculation of percentage Example calculation: $80 - 43 = 37 \text{ (cm}^3\text{)} (1)$ $100 + 10 + 80 = 190 \text{ (cm}^3\text{)} (1)$ $(37 \times 100) \div 190 (= 19.47\%)$ $= 19\% (1)$	accept 19.47% or 19.5%	3

Question number	Answer	Mark
6(c)	- Decreased (1) - Decreased (1) - No effect (1)	3

Total for Question 6 = 8 marks

Question number	Answer	Additional guidance	Mark
7(a)			
	thermometer reading at end/°C	(26.8)	
	thermometer reading at start/°C	18.7	1 mark for temperature at start
	temperature rise/°C	8.1	1 mark for temperature rise consequential on readings
			2

Question number	Answer	Mark
7(b)(i)	29.5	1

Question number	Answer	Mark
7(b)(ii)	20.8	1

Question number	Answer	Additional guidance	Mark
7(c)	• Calculation of volume/mass of mixture • Calculation of temperature increase • Substitution of values into $q=mc\Delta T$ • Calculation of heat energy released with unit Example calculation: 20.0 + 20.0 = 40.0 (cm³) (1) 30.0–18.5 = 11.5 (°C) (1) $q = 40.0 \times 4.2 \times 11.5$ (1) $q = 1900 \text{ J}$ (1) (1932 J)	accept 1930 accept answers to three or more significant figures	4

Total for Question 7 = 8 marks

Question number	Answer	Mark
8(a)	An explanation that makes reference to the following points: (all) contain carbon and hydrogen (1) - only/but no other elements (1)	2

Question number	Answer	Mark
8(b)	(The only one that shows) all atoms and all bonds	1

Question number	Answer	Mark
8(c)	A, C, D and F	1

Question number	Answer	Mark
8(d)(i)	$\text{C}_3\text{H}_8 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$ 1 mark for both product formulae correct (1) 1 mark for balancing (1)	2

Question number	Answer	Additional guidance	Mark
8(d)(ii)	An explanation that makes reference to the following points: - sulfur dioxide reacts with water (1) - to form an acid (1)	accept sulfuric or sulfurous	2

Total for Question 8 = 8 marks

TOTAL FOR PAPER = 60 MARKS