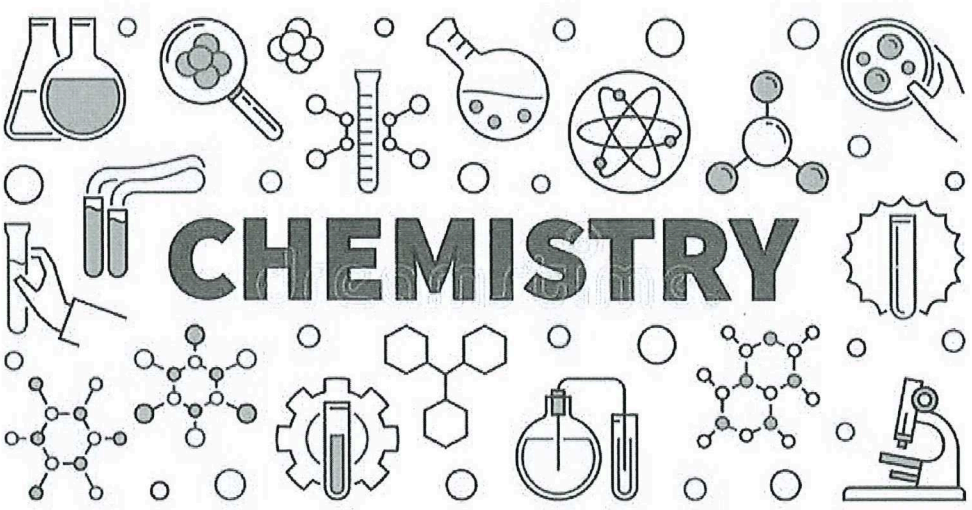


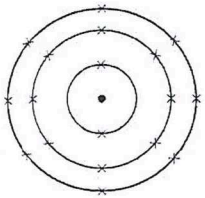
WJEC Chemistry 1

Dual Award – Foundation Tier

1.2 Mark Scheme

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
5	(a)			The melting point increases ✓ The melting point decreases The melting point increases and then decreases There is no trend in the melting point		1		1		
	(b)			CL2 ; Cl_2 ✓ ; cl_2 ; 2Cl	1			1		
	(c)			any value between –100°C and 19°C (1) above melting point / –101°C and below room temperature / 20°C (1) accept between melting point and room temperature for second mark			2	2	2	
	(d)			poisonous / toxic	1			1		
	(e)			Statement about astatine / True / False Is a solid at room temperature — True Will conduct electricity — False Has a melting point higher than 114°C — True Is coloured — True all correct for (2) any 2 correct for (1)			2	2		
				Question 5 total	**2**	**1**	**4**	**7**	**2**	**0**

Question	Marking details	Marks Available					
		AO1	AO2	AO3	Total	Maths	Prac
6	**Indicative content** flame test – wire/damp splint dipped in compounds and placed in roaring flame • potassium bromide gives lilac flame • barium chloride gives apple-green flame • calcium iodide gives brick-red flame silver nitrate test – dissolve some of each compound in a small amount of water and add silver nitrate solution • potassium bromide gives cream precipitate • barium chloride gives white precipitate • calcium iodide gives yellow precipitate	6			6		6
	5-6 marks Both tests given, basic description, correct observations linked to correct compounds *There is a sustained line of reasoning which is coherent, relevant, substantiated and logically structured. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.* **3-4 marks** Complete account of one test with correct observations for all ions or partial account of both with some correct observations linked to correct compounds *There is a line of reasoning which is partially coherent, largely relevant, supported by some evidence and with some structure. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.* **1-2 marks** Partial account of one test with one correct observation linked to correct compound *There is a basic line of reasoning which is not coherent, largely irrelevant, supported by limited evidence and with very little structure. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.* **0** *No attempt made or answer worthy or any credit.*						
	Question 6 total	**6**	**0**	**0**	**6**	**0**	**4**

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
8/2	(a)	(i)		**E**	1			1		
		(ii)		**D**		1		1		
		(iii)		**C** and **E** (1) both needed same number of protons (atomic number) but different number of neutrons (mass number) (1)	1	1		2		
	(b)	(i)				1		1		
		(ii)		full **outer** shell (of electrons) accept both have 8 electrons in their **outer** shell	1			1		
				Question 8/2 total	**3**	**3**	**0**	**6**	**0**	**0**

Foundation Tier only questions

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
1	(a)	(i)		proton +1 (1) neutron 1 (1)	2			2		
		(ii)		6		1		1		
	(b)	(i)		lithium	1			1		
		(ii)		lithium oxide	1			1		
		(iii)		lithium / oxygen	1			1		1
		(iv)		Li_2O		1		1		
				Question 1 total	**5**	**2**	**0**	**7**	**0**	**1**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
4	(a)			**D** (1) no change in appearance and no temperature change (when mixed) (1) do **not** credit reason if letter other than **D** is given	2			2		2
	(b)	(i)		limewater turns milky/cloudy	1			1		1
		(ii)		Na_2CO_3		1		1		
	(c)	(i)		**C**			1	1		1
		(ii)		orange/yellow	1			1		1
				Question 4 total	**4**	**1**	**1**	**6**	**0**	**5**

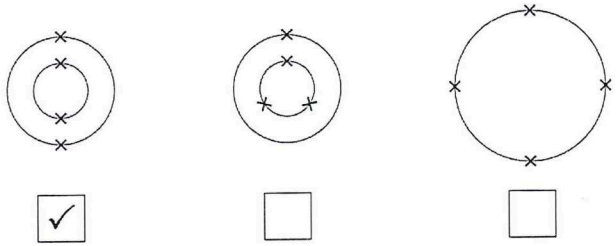
Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
8/2	(a)	(i)		increase down the group / decrease up the group		1		1	1	
		(ii)		liquid (1) award (1) for either of following • 400°C is higher than its melting point but lower than its boiling point • 400°C is between its melting point and boiling point		2		2		
		(iii)		either of following • it has metal and non-metal properties • it has a high boiling point/is a semi conductor (metal properties) **but** it has a low melting point/has a low density (non-metal properties)			1	1		
	(b)	(i)		173		1		1	1	
		(ii)		45.7 / 46 (2) if incorrect award (1) for $\frac{79}{173}$ ecf possible from part (i)		2		2	2	
				Question 8/2 total	**0**	**6**	**1**	**7**	**4**	**0**

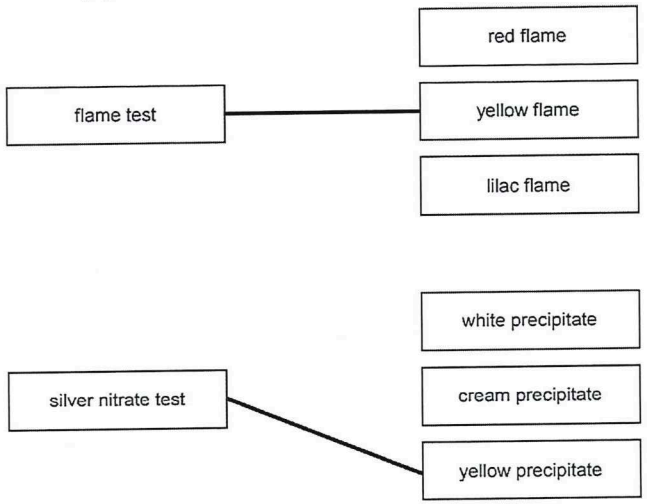
Foundation Tier only questions

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
1				award (1) for each correct answer						
				E (accept calcium)	1					
				A (accept hydrogen)		1				1
				C (accept silicon)		1				
				D (accept chlorine)		1				
				B (accept neon)	1			5		1
				Question 1 total	**2**	**3**	**0**	**5**	**0**	**2**

Common questions

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
8/1	*(a)*			2,8,7 (1) phosphorus (1) 4 (1)		3		3		
	(b)	(i)		award (1) for any of following • lilac flame • moves • floats • melts / forms ball • bubbles of gas / effervescence	1			1		1
		(ii)		award (1) for any of following • use a safety screen • add only a small piece of potassium • use excess water • use tongs to hold potassium	1			1		1
		(iii)		KOH		1		1		
		(iv)		11/12/13/14 accept any value 8-14		1		1		1
		(v)		award (1) for any of following • rubidium • caesium • francium	1			1		
				Question 8/1 total	**3**	**5**	**0**	**8**	**0**	**3**

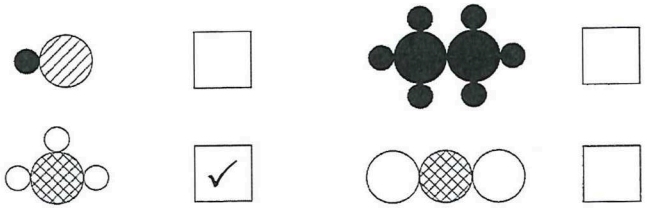
Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
3	(a)			award (1) for each correct number Beryllium has ..... 4 ..... protons. The atomic number of beryllium is ..... 4 ..... . The mass number of beryllium is ..... 9 ..... . Beryllium has ..... 5 ..... neutrons.		4		4		
	(b)			 ✓		1		1		
	(c)			3		1		1		
				Question 3 total	**0**	**6**	**0**	**6**	**0**	**0**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
6	(a)			award (1) for each correct line  	2			2		2
	(b)	(i)		award (1) for each correct formula AgI $NaNO_3$		2		2		
		(ii)		filtration			1	1		1
				Question 6 total	**2**	**2**	**1**	**5**	**0**	**3**

Common questions

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
8/1	(a)	(i)		award (1) for any of following to prevent it from reacting with air / oxygen / water (vapour) (in the air) because it reacts with air / oxygen / water (vapour) (in the air) to prevent oxidation / tarnishing	1			1		
		(ii)		it gets duller / tarnishes / loses its shine / turns white / turns grey neutral answers – changes colour / changes appearance	1			1		1
		(iii)		Na_2O		1		1		
	(b)	(i)		chlorine is toxic / poisonous	1			1		
		(ii)		$2Na + Cl_2 \rightarrow 2NaCl$ award (2) for correct equation if incorrect award (1) for correct formula of product		2		2		2
	(c)	(i)		–25 °C ☐ 25 °C ☐ 100 °C ☐ 150 °C ☑			1	1	1	
		(ii)		award (1) for any of following astatine will react <u>very</u> slowly / more slowly than iodine astatine will not react with hot iron astatine is less reactive than iodine / the least reactive neutral answers – quite slow / takes a long time to react reactivity decreases down the group (1)			2	2		
				Question 8/1 total	**3**	**3**	**3**	**9**	**1**	**3**

FOUNDATION TIER ONLY QUESTIONS

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
1	(a)	(i)		hydrogen bromide accept HBr		1		1		
		(ii)		carbon **and** hydrogen **both** needed, either order		1		1		
		(iii)		3		1		1		
		(iv)				1		1		
	(b)			H_2CO_2 accept correct number of atoms in **any** order		1		1		
	(c)	(i)		Li^+ and Cl^- **both** needed		1		1		
		(ii)		$MgBr_2$		1		1		

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
		(iii)		$2Ca + O_2 \longrightarrow 2CaO$ ✓ $Ca + O_2 \longrightarrow 2CaO$ $Ca + O \longrightarrow CaO$		1		1		
				Question 1 total	**0**	**8**	**0**	**8**	**0**	**0**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
5				**Indicative content** use large trough of water small piece of metal tongs safety glasses safety screen lithium - least reactive – floats, moves slowly and only produces a small amount bubbles sodium - floats, melts into a ball, moves quickly and produces more bubbles potassium - most reactive – floats, moves very quickly, burns with a lilac flame and produces a large amount of bubbles **5-6 marks** Good safety precautions; good description of observations with some specific detail; clear indication of order of reactivity *There is a sustained line of reasoning which is coherent, relevant, substantiated and logically structured. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.* **3-4 marks** One safety precaution; basic description of general observations for Group 1 metals; some reference to order of reactivity *There is a line of reasoning which is partially coherent, largely relevant, supported by some evidence and with some structure. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.*	6			6		6

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
				1-2 marks Basic reference to safety; some relevant observations *There is a basic line of reasoning which is not coherent, largely irrelevant, supported by limited evidence and with very little structure. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.* **0 marks** *No attempt made or no response worthy of credit.*						
				Question 5 total	**6**	**0**	**0**	**6**	**0**	**6**

COMMON QUESTIONS

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
7/1	(a)			**A** and **B** (1) **both** needed both contain two shells (of electrons) (1)	1	1		2		
	(b)			**D** (1) has a full outer shell (of electrons) (1) accept **all** shells full neutral answers has 8 electrons in outer shell has full shell		2		2		
	(c)			award (1) for either of following • number of electrons (in the shells) is equal to the number of protons (in the nucleus) • **E** has 11 electrons so it also has 11 protons award (1) for either of following • number of protons is equal to the atomic number • because it has 11 protons its atomic number is 11 number of electrons, number of protons and atomic number must all be linked to gain both marks	2			2		

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
	(d)			**4** $K + O_2 \rightarrow 2\ K_2O$ award (1) for K_2O award (1) for balancing only if formula correct		2		2		
				Question 7/1 total	**3**	**5**	**0**	**8**	**0**	**0**