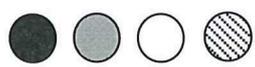


WJEC Chemistry 1
Option – Foundation Tier
1.2 Mark Scheme

Question	Marking details	Marks available						
		AO1	AO2	AO3	Total	Maths	Prac	
2								
(a)	award (1) for every correct answer protons neutrons electrons protons	4			4			
(b)								
(i)	2		1		1			
(ii)	4	1			1			
(iii)	2,8,8,2	1			1			
(iv)	3		1		1			
(c)								
(i)	hydrogen / H nitrogen / N oxygen / O carbon / C							
	 all 4 correct for (2) 2/3 correct for (1)			2	2			
(ii)	 do not accept:   atoms must be touching		1		1			
(d)		1			1			
(ii)	8	1			1			
	Question 2 total	8	3	2	13	0	0	0

Question	Marking details	Marks available					
		AO1	AO2	AO3	Total	Maths Prac	
3 (a)	melting point 60°C boiling point 780°C <input checked="" type="checkbox"/>			1	1	1	
(b)	B D C A all four correct for (2) two/three correct for (1)			2	2		2
(ii)	explosion / explosive / more violent (than rubidium) / very violent / trough smashes neutral answer: violent / more dangerous			1	1		1
(iii)	any of following for (1) small piece of metal / excess water / a lot of water / use a trough / stand well back / safety screen / goggles / use tweezers / wear gloves / use a fume cupboard neutral answer: cover / glass protection	1			1		1
(c)	Na ₂ O		1		1		
(d)	C		1		1	1	
	Question 3 total	1	2	4	7	2	4

Common questions

Question	Marking details	Marks available					
		AO1	AO2	AO3	Total	Maths Prac	
8/1							
(a)	award (1) for every correct answer A and C both needed, either order C B A D	1 1 1	1 1		5		
(b)	(i)		1		1		
	(ii)		1		1		
(c)	both have 7 protons (and 7 electrons) (1) nitrogen-14 has 7 neutrons and nitrogen-15 has 8 neutrons (1) award (1) for general description of isotopes e.g. same number of protons, different number of neutrons		2		2		
	Question 8/1 total	3	6	0	9	0	0

Foundation Tier only questions

Question	Marking details	Marks available								
		AO1	AO2	AO3	Total	Maths	Prac			
1	(a)	electrons (1) nucleus (1)								
	(b)	protons and neutrons – both needed (1)	3			3				
	(b)	<p>proton — 0</p> <p>neutron — +1</p> <p>electron — -1</p> <p>award (2) for all three correct award (1) for any one correct</p>	2			2				
	(c)	(i) A and B – both needed		1		1				
		(ii) B		1		1				
		(iii) C		1		1				
		(iv) B and D – both needed		1		1				
		Question 1 total	5	4	0	9	0	0		

FOUNDATION TIER QUESTIONS

Question		Marking details	Marks available					
			AO1	AO2	AO3	Total	Maths	Prac
1	(a)	A and D (1) C (1)		2		2		
	(ii)	I 2,8 II 10	1			1		
	(b)	electron (1) neutron (1)	1	1		2		
	(ii)	award (1) for either of following 7 particles in nucleus 3 protons and 4 neutrons (in the nucleus)		1		1		
		Question 1 total	3	4	0	7	0	0

Question	Marking details	Marks available					
		AO1	AO2	AO3	Total	Maths Prac	
5	(a)			1	1	1	
	(i)	decreases					
	(b)						
	(i)	tin / Sn	1		1	1	
	(ii)	silicon / germanium / Si / Ge			1		
	(c)						
	(i)	they are all found between metals and non-metals	1		1		
	(ii)	carbon + oxygen → carbon dioxide		1	1		
	(iii)	award (1) for any of following <ul style="list-style-type: none"> • global warming • climate change • rising sea levels • habitat destruction • icecaps melting quicker • more freak weather conditions • increased flooding 	1		1		
		Question 5 total	3	2	1	6	2 0

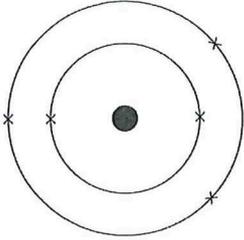
Question	Marking details				Marks available																									
	AO1	AO2	AO3	Total	Maths	Prac																								
6	(a)	(i)	<table border="1"> <thead> <tr> <th></th> <th>Mendeleev only</th> <th>Today only</th> <th>Both tables</th> </tr> </thead> <tbody> <tr> <td>the table is organised into groups</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>copper and potassium are in the same group</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>there are gaps in the table</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>fluorine and chlorine are in the same group</td> <td></td> <td></td> <td>✓</td> </tr> </tbody> </table>					Mendeleev only	Today only	Both tables	the table is organised into groups			✓	copper and potassium are in the same group	✓			there are gaps in the table	✓			fluorine and chlorine are in the same group			✓				
				Mendeleev only	Today only	Both tables																								
			the table is organised into groups			✓																								
			copper and potassium are in the same group	✓																										
			there are gaps in the table	✓																										
fluorine and chlorine are in the same group			✓																											
award (2) for all four correct award (1) for any two or three correct				2			2																							
(ii)			germanium has exactly the same atomic mass as that predicted for ekasilicon	<input type="checkbox"/>																										
			germanium has a different colour to that predicted for ekasilicon	<input type="checkbox"/>																										
			germanium has a similar density to that predicted for ekasilicon	<input checked="" type="checkbox"/>																										
			germanium oxide has the same ratio of atoms as that predicted for ekasilicon oxide	<input checked="" type="checkbox"/>																										
			germanium oxide and germanium chloride have the same ratio of atoms	<input type="checkbox"/>																										
				1			1																							

Question	Marking details	Marks available				
		AO1	AO2	AO3	Total	Prac
(b)	30.5% / 30.48 % (2)		2		2	
(i)	if incorrect award (1) for M_r of 105					
(ii)	$\text{GeO}_2 + 4\text{HCl} \rightarrow \text{GeCl}_4 + 2\text{H}_2\text{O}$		1		1	
	Question 6 total	0	3	3	6	0

COMMON QUESTIONS

Question		Marking details	Marks available					
			AO1	AO2	AO3	Total	Maths	Prac
9/1	(a)	increases ignore references to sodium/potassium anomaly			1	1	1	
	(ii)	reactivity increases (1) award (1) for either of following <ul style="list-style-type: none"> the outer electron gets further from nucleus so it is easier to lose it there are more shells so it is easier to lose the outer electron 	2			2		
	(b)	award (1) for either of following <ul style="list-style-type: none"> small piece of sodium use tweezers to handle sodium use in fume cupboard (1)	2			2		2
	(ii)	award (2) for correct balanced equation $2\text{Na} + \text{Cl}_2 \rightarrow 2\text{NaCl}$ if incorrect award (1) for NaCl		2		2		
		Question 9/1 total	4	2	1	7	1	2

Question	Marking details	Marks available				
		AO1	AO2	AO3	Total	Maths Prac
3 (a)	7		1		1	
(b)	Cl ₂		1		1	
(c) (i)	<p>glowed less brightly than iodine <input type="checkbox"/></p> <p>glowed less brightly than chlorine <input checked="" type="checkbox"/></p> <p>glowed more brightly than chlorine <input type="checkbox"/></p>		1		1	1
(ii)	I FeBr ₃		1		1	
	II iron bromide ignore any bracketed numbers		1		1	
(d)	<p>to disinfect skin before surgery <input checked="" type="checkbox"/></p> <p>to make coloured fireworks <input type="checkbox"/></p> <p>to sterilise swimming pools <input type="checkbox"/></p> <p>to fill party balloons <input type="checkbox"/></p>	1			1	
	Question 3 total	1	5	0	6	1

Question	Marking details	Marks available					
		AO1	AO2	AO3	Total	Maths	Prac
6	(a)		2		2		
	(i)	atomic number \Rightarrow 5 (1) mass number \Rightarrow 11 (1)					
	(ii)	 <p>accept 2,3 as a written alternative</p>	1		1		
	(iii)	<p>equal numbers of protons and electrons (1)</p> <p>protons are positive and electrons are negative / protons and electrons have opposite charges (1)</p> <p>neutral answers any reference to neutrons charges cancel out</p>	2		2		
	(b)						
	(i)	nitrogen accept N / N ₂		1	1		
	(ii)	5 electrons in <u>outer</u> shell / orbit		1	1		
	(iii)	2 (electron) shells / orbits		1	1		
		Question 6 total	2	6	8	0	0

Question	Marking details	Marks available				
		AO1	AO2	AO3	Total	Maths Prac
2	(a) true (1) true (1) false (1) false (1)	2	2		4	
	(b) 70 (2) if incorrect award (1) for any clear indication of correct number of atoms of each element e.g. $(2 \times B) + (3 \times O) / 2(11) + 3(16)$		2		2	2
	(c) A		1		1	
	(d) MgF ₂		1		1	
	Question 2 total	2	6	0	8	2 0

Question	Marking details	Marks available					
		AO1	AO2	AO3	Total	Maths	Prac
7	<p>(a)</p> <p>(i)</p> <p>Helium is a gas <input type="checkbox"/></p> <p>Helium is the second most common element in the Universe <input type="checkbox"/></p> <p>Helium is less dense than air <input checked="" type="checkbox"/></p> <p>Helium is colourless <input type="checkbox"/></p>			1	1		
	<p>(ii)</p> <p>The Earth's atmosphere contains more helium than argon <input type="checkbox"/></p> <p>The Earth's atmosphere contains more xenon than helium <input type="checkbox"/></p> <p>The Earth's atmosphere contains more helium than krypton <input checked="" type="checkbox"/></p>		1		1	1	
	<p>(iii)</p> <p>There isn't much helium in the Earth's atmosphere <input type="checkbox"/></p> <p>Scientists say helium shouldn't be used to fill balloons <input type="checkbox"/></p> <p>Helium is a finite resource <input checked="" type="checkbox"/></p>			1	1		

Question	Marking details	Marks available					
		AO1	AO2	AO3	Total	Maths	Prac
(iv)	<p>Only helium gas can leak away into space <input type="checkbox"/></p> <p>Helium and neon gases can leak away into space <input checked="" type="checkbox"/></p> <p>Only argon can leak away into space <input type="checkbox"/></p> <p>All inert gases can leak away into space <input type="checkbox"/></p>			1	1	1	
(b)	<p>All Group 0 elements have 2 electrons in their inner shell <input type="checkbox"/></p> <p>All Group 0 elements have 8 electrons in their outer shell <input type="checkbox"/></p> <p>All Group 0 elements have full outer shells <input checked="" type="checkbox"/></p> <p>All Group 0 elements have some full shells <input type="checkbox"/></p>	1			1		
	Question 7 total	1	1	3	5	2	0

Question		Marking details	Marks available					
			AO1	AO2	AO3	Total	Maths	Prac
9/1	(a)	<p>A (1)</p> <p>B (1)</p> <p>F (1)</p> <p>D (1)</p>	1			4		
	(b)		1			1		
	(c)	<p>number of protons 15</p> <p>number of neutrons 20</p> <p>number of electrons 19</p>	3			3		
	(ii)	isotopes	1			1		
		Question 9/1 total	6	3	0	9	0	0

Question		Marking details	Marks available						
			AO1	AO2	AO3	Total	Maths	Prac	
10/2	(a)	(i)	award (1) for any of following <ul style="list-style-type: none"> they have same number of electrons in their outer shell they have 1 electron in their outer shell they lose 1 electron when reacting 	1			1		
		(ii)	density			1			
	(b)	(i)	stored in oil / liquid paraffin do not accept paraffin	1			1		1
		(ii)	sodium hydroxide / NaOH (1) hydrogen / H ₂ (1)	2			2		
		(iii)	lithium / Li	1			1		
		(iv)	NaF		1		1		
	(c)	(i)	61 (2) if incorrect award (1) for any of following figures in method or as final answer 114 0.61 / 0.606 10.1 / 10		2		2	2	
		(ii)	mass medication / medical treatment without permission / no choice neutral answers any health problem not needed because it's in toothpaste	1			1		

Question	Marking details	Marks available					
		AO1	AO2	AO3	Total	Maths	Prac
(iii)	toothpaste accept mouthwash neutral answers dental products fluoride supplements	1			1		
	Question 10/2 total	7	3	1	11	2	1