

IONIC BONDING 1

MARK SCHEME

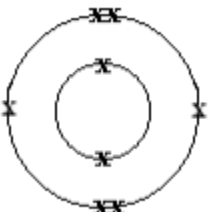
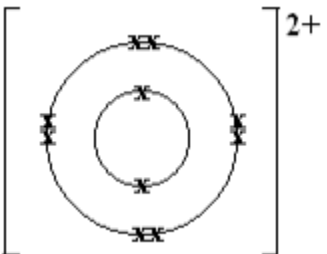
Question 1.

Question	Answer	Extra information	Marks
(i)	7		1
(ii)	sodium (atom) loses (electron) and iodine (atom) gains (an electron) 1 electron (electrostatic) attraction or forms ionic bond(s)	reference to incorrect bonding or incorrectly named particle = max 2 any or all marks can be obtained from a labelled diagram ignore inner shell electrons if shown	1 1 1
(iii)	ions can move (in the solution)		1
Total marks			5

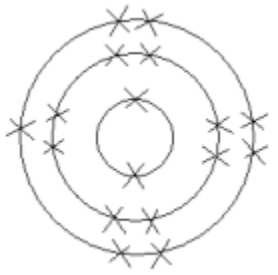
Question 2.

Question	Answer	Extra information	Marks
	because calcium is +2 and hydroxide is -1 or to make the compound neutral (in terms of charges)	accept to balance the charges allow calcium needs to lose 2 electrons and hydroxide needs to gain one electron	1
Total marks			1

Question 3.

Question	Answer	Extra information	Marks
(a)	$2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$	accept correct multiples / fractions	1
(b)		electrons do not need to be paired accept dots / circles / e instead of crosses do not allow 2.6 without diagram	1
(c)		electrons do not need to be paired allow without brackets must have the charge accept dots / circles / e instead of crosses ignore extra empty outer shells ignore nucleus do not allow [2.8]2+ without diagram	1
(d)	oppositely charged (ions / atoms) (they) attract	allow positive and negative (ions / atoms) must be in correct context accept held by electrostatic forces ignore ionic bonding maximum 1 if they refer to intermolecular forces / attractions / covalent bonds	1 1
Total marks			5

Question 4.

Question	Answer	Extra information	Marks
(a)		accept dots / crosses / e must be drawn on diagram electrons do not need to be paired ignore brackets or + or - charges ignore 2,8,7	1
(b)	(one) electron lost / given away / transferred from sodium / transferred to chlorine owtte	recognition that electrons are involved must be linked to electrons accept loses electron(s) for 2 marks	1 1

		NB loses 2 or more electrons gains 1 mark reference to sharing / covalent max 1 mark ignore charges on ions formed	
Total marks			3

Question 5.

Question	Answer	Extra information	Marks
(a)	any two from: <ul style="list-style-type: none"> forces (of attraction) / bonds are strong or lot of energy needed to break bonds oppositely charged ions attract or electrostatic attraction between ions giant structure or lattice 	mention of molecules / intermolecular / covalent / atoms = max 1 allow many bonds ignore ionic bonding unqualified	2
(b)	any four from: <ul style="list-style-type: none"> potassium (atom) loses (an electron) and iodine (atom) gains (an electron) 1 electron iodide (ion) has negative charge potassium (ion) has positive charge electrostatic attraction or ionic bonding 	If atom or ion omitted = max 3 sharing / covalent / metallic = max 3 ignore reference to full outer shells allow iodine ion accept stable (structure) or noble gas (structure)	4
Total marks			6

Q6.

Question	Answer	Extra information	Marks
(a)(i)	losing		1
(ii)	a positive		1
(iii)	electrostatic		1
(b)	high melting points		1

	strong bonds		1
Total marks			5

Q7.

Question	Answer	Extra information	Marks
2 Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response.			
0 marks	Level 1 (1–2 marks)	Level 2 (3–4 marks)	Level 3 (5–6 marks)
No relevant content	There is a statement about the bonding and/or structure or melting / boiling point of chlorine or sodium chloride	There are statements about the bonding and/or structure of chlorine or sodium chloride.	There are statements about the bonding and/or structure of chlorine and sodium chloride. There is an explanation of why chlorine is a gas or sodium chloride is a solid
<p>Examples of chemistry points made in response:</p> <p>Chlorine: covalent bonds between atoms forming simple molecules no / weak attraction / bonds between molecules low boiling point</p> <p>Sodium chloride: ionic bonds or electrostatic attraction strong bonds in all directions between oppositely charged ions forming giant lattice large amounts of energy needed to break bonds high melting point</p>			
Total marks			6