

# Ionic Bonding

## Question Paper

Level	O Level
Subject	Chemistry
Exam Board	Cambridge International Examinations
Topic	The Particulate Nature of Matter
Sub-Topic	Ionic Bonding
Booklet	Question Paper

**Time Allowed:** 17 minutes

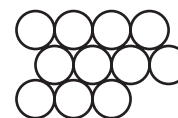
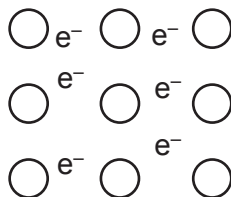
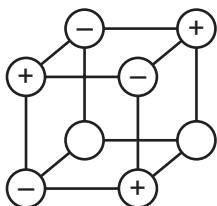
**Score:** /14

**Percentage:** /100

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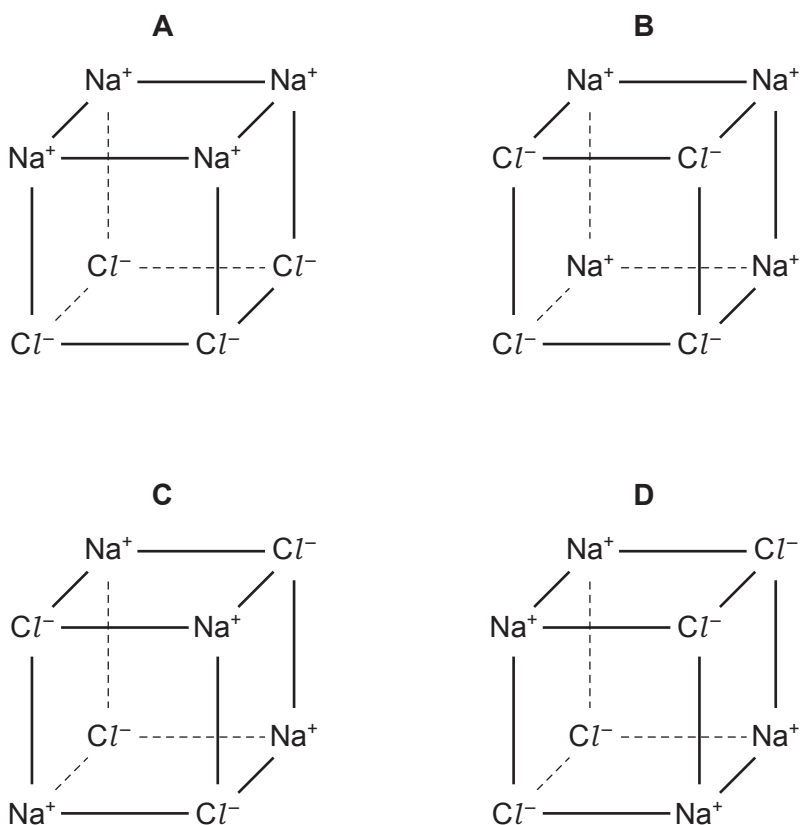
- 1 What happens when sodium chloride melts?
  - A Covalent bonds in a giant lattice are broken.
  - B Electrons are released from atoms.
  - C Electrostatic forces of attraction between ions are overcome.
  - D Molecules are separated into ions.
  
- 2 Which statement describes ionic bonding?
  - A a lattice of ions in a sea of electrons
  - B electrostatic attraction between oppositely charged ions
  - C the sharing of electrons between atoms to gain a noble gas configuration
  - D the transfer of electrons from atoms of a non-metal to the atoms of a metal
  
- 3 The diagrams show the arrangement of particles in three **solids**: krypton, potassium and sodium chloride.



In which order are the solids shown?

- A krypton; potassium; sodium chloride
  - B krypton; sodium chloride; potassium
  - C sodium chloride; krypton; potassium
  - D sodium chloride; potassium; krypton
- 
- 4 An ionic bond is formed by
    - A electron sharing between metals and non-metals.
    - B electron sharing between non-metals.
    - C electron transfer between non-metals.
    - D electron transfer from metals to non-metals.

5 Which diagram correctly shows the arrangement of the ions in solid sodium chloride?



6 Four substances have the following electrical properties.

substance	property
W	does not conduct under any conditions
X	conducts only in aqueous solution
Y	conducts in both the molten and solid states
Z	conducts in both the molten and aqueous states

What are these four substances?

	W	X	Y	Z
<b>A</b>	HCl	S	NaCl	Pb
<b>B</b>	Pb	HCl	NaCl	S
<b>C</b>	S	HCl	Pb	NaCl
<b>D</b>	S	NaCl	HCl	Pb

- 7 In terms of electrons, what happens when potassium combines with iodine to form a compound?
- A The atoms of both elements each lose one electron.
  - B The atoms of both elements each gain one electron.
  - C The potassium atoms each lose one electron and the iodine atoms each gain one electron.
  - D The potassium atoms each gain one electron and the iodine atoms each lose one electron.
- 8 The table gives the arrangements of electrons in the atoms of four different elements.

Which element does not form an ionic compound with chlorine?

	arrangement of electrons
A	2.1
B	2.4
C	2.8.1
D	2.8.2

- 9 For which compound is the type of bonding correct?

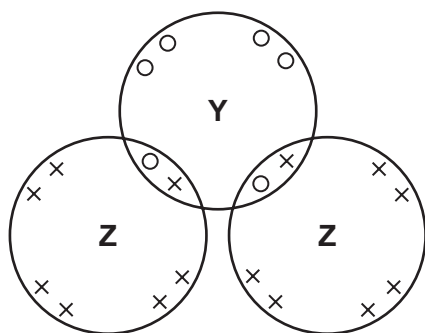
	compound	bonding
A	ammonia	ionic
B	carbon dioxide	covalent
C	sodium chloride	covalent
D	water	ionic

- 10 Which compound has both ionic and covalent bonds?

- A ammonium chloride
- B carbon dioxide
- C ethyl ethanoate
- D sodium chloride

- 11 Why does molten sodium chloride conduct electricity?
- A An electron is completely transferred from sodium to chlorine.
  - B Sodium ions are only weakly attracted to the chloride ions.
  - C The electrons in the sodium chloride are free to move.
  - D The sodium ions and the chloride ions are free to move.
- 12 How does a magnesium atom form a bond with an oxygen atom?
- A by giving one pair of electrons to the oxygen atom
  - B by sharing one pair of electrons, both electrons provided by the magnesium atom
  - C by sharing two pairs of electrons, both pairs provided by the oxygen atom
  - D by sharing two pairs of electrons, each atom donating one pair of electrons
- 13 Hydrogen can form both ionic and covalent compounds.
- With which element will hydrogen form an ionic compound?
- A carbon
  - B chlorine
  - C nitrogen
  - D sodium

14 The diagram shows the arrangement of electrons in a molecule of compound  $\text{YZ}_2$ .



key

- outer electron of a **Y** atom
- × outer electron of a **Z** atom

What are elements **Y** and **Z**?

	<b>Y</b>	<b>Z</b>
<b>A</b>	calcium	chlorine
<b>B</b>	carbon	oxygen
<b>C</b>	oxygen	hydrogen
<b>D</b>	sulphur	chlorine