**6** Which statement describes the formation of bonds in lithium bromide?

**A** A lithium atom donates one electron to a bromine atom.

**B** A bromine atom donates one electron to a lithium atom.

**C** A lithium atom shares a pair of electrons with a bromine atom.

**D** A bromine atom donates a pair of electrons to a lithium atom.



**7** Which statement describes the structure of sodium chloride?

**A** a lattice of alternating positive and negative ions

**B** a lattice of positive ions surrounded by a 'sea' of delocalised electrons

**C** a mixture of sodium and chlorine atoms

**D** a regular lattice of sodium and chlorine atoms



**5** Which statement describes all positive ions?

**A** Positive ions have more electrons than neutrons.

**B** Positive ions have more protons than neutrons.

**C** Positive ions have more electrons than protons.

**D** Positive ions have more protons than electrons.





**2** Table 2.1 shows the melting points, boiling points and electrical conductivities of seven substances, **A**, **B**, **C**, **D**, **E**, **F** and **G**.

**Table 2.1**

| substance | melting point / °C | boiling point / °C | electrical conductivity when solid | electrical conductivity when molten |
|---|---|---|---|---|
| **A** | 1600 | 2230 | poor | poor |
| **B** | –219 | –183 | poor | poor |
| **C** | 770 | 1420 | poor | good |
| **D** | –39 | 357 | good | good |
| **E** | –7 | 58 | poor | poor |
| **F** | 44 | 280 | poor | poor |
| **G** | 1085 | 2562 | good | good |

**(a)** Identify which substance, **A**, **B**, **C**, **D**, **E**, **F** or **G**, is:

**(i)** a gas at 25 °C

..... [1]

**(ii)** a solid consisting of simple molecules at 25 °C

..... [1]

**(iii)** a metal which is liquid at 25 °C.

..... [1]

**(b) (i)** Identify which substance, **A**, **B**, **C**, **D**, **E**, **F** or **G**, has a giant covalent structure.

Use the information in Table 2.1 to give **two** reasons for your choice.

substance .....

reason 1 .....

reason 2 .....

[3]

**(ii)** Identify which substance, **A**, **B**, **C**, **D**, **E**, **F** or **G**, is an ionic compound.

Use the information in Table 2.1 to give **one** reason for your choice.

substance .....

reason .....

[2]

[Total: 8]

**6** Which statement about ionic compounds is correct?

**A** Giant lattices are formed when ionic compounds crystallise from solution.

**B** In all ionic compounds, the metal ions have fewer electrons than the non-metal ions.

**C** In a giant lattice, ions of the same charge are closer together than ions of opposite charge.

**D** When ionic compounds melt, strong intermolecular forces are broken.



**2** This question is about ionic compounds.

**(a)** State what is meant by the term ionic bond.

.....

..... [2]

**(b)** Potassium sulfide, $K_2S$, is an ionic compound.

Complete the dot-and-cross diagram in Fig. 2.1 of the ions in potassium sulfide.

Show the charges on the ions.

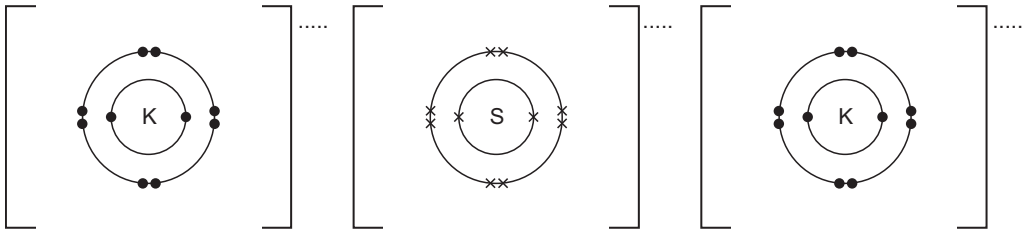


**Fig. 2.1**

[3]





**(c)** Ionic compounds form giant ionic lattices.

**(i)** Fig. 2.2 shows part of the giant ionic lattice structure of sodium chloride.

Complete the diagram in Fig. 2.2 to show the ions present. Use '+' for sodium ions and '–' for chloride ions. One chloride ion has been completed for you.

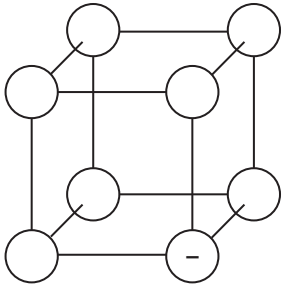


**Fig. 2.2**

[2]

**(ii)** State the name given to any positive ion.

..... [1]

**(d)** Ionic compounds can be decomposed by the passage of an electric current using inert electrodes.

**(i)** State the name of this process.

..... [1]

**(ii)** Write the ionic half-equation for the reaction which takes place at the anode when **molten** potassium bromide, KBr, is decomposed by the passage of an electric current.

..... [2]

**(iii)** Name the products and state the observations at the negative and positive electrodes when **dilute aqueous** potassium bromide, KBr, is decomposed by the passage of an electric current.

product at the negative electrode

.....

observations at the negative electrode

.....

products at the positive electrode

..... and .....

observations at the positive electrode

.....

[5]