Oxford Cambridge and RSA

GCSE Chemistry B (Twenty First Century Science)

J258/04 Depth in chemistry (Higher Tier)

Question Set 26

1. Sodium oxide, Na_2O and magnesium oxide, MgO, are both oxides with ionic bonds. When ionic bonds form, electrons pass from one atom to another to form ions.

Fig. 5.1 and **Fig. 5.2** show the arrangement of electrons in the **atoms** and **ions** for each oxide.

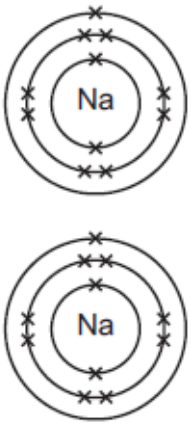
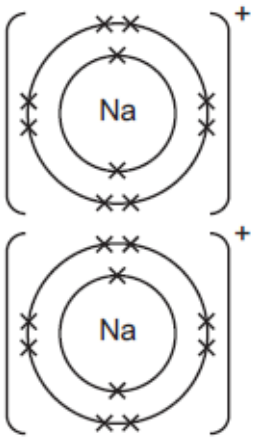
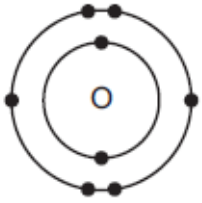
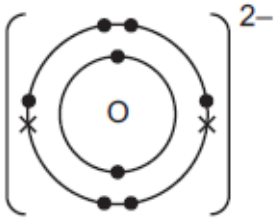
Sodium oxide Na_2O	
Atoms (before bonding)	**Ions (after bonding)**
two sodium atoms 	**two** sodium ions 
one oxygen atom 	**one** oxygen ion 

Fig. 5.1

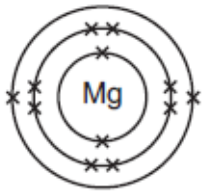
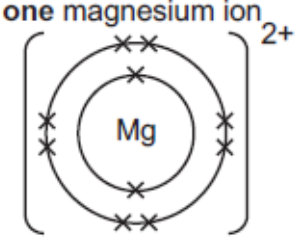
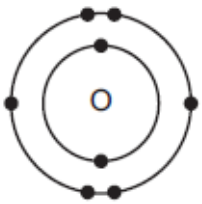
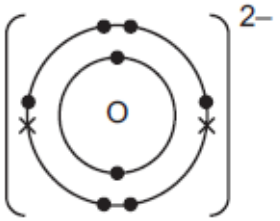
Magnesium oxide MgO	
Atoms (before bonding)	**Ions (after bonding)**
one magnesium atom 	**one** magnesium ion 
one oxygen atom 	**one** oxygen ion 

Fig. 5.2

(a)* **Describe** and **explain** how ionic bonds in sodium oxide (**Fig. 5.1**) and magnesium oxide (**Fig. 5.2**) form, and explain why the two oxides have different formulae.

Use ideas about electrons and electron shells in your answer.

[6]

(b) Sodium oxide and magnesium oxide are both ionic compounds.

Which statements about **both** sodium oxide **and** magnesium oxide are correct?

Tick (✓) **two** boxes.

Their boiling points are $>$ 100 °C.	☐
They conduct electricity when molten.	☐
They have very low melting points.	☐
They have weak intermolecular forces between their particles.	☐
They react with dilute acids to give a salt, water and carbon dioxide.	☐

[2]

Total Marks for Question Set 26: 8

Resource Materials

The Periodic Table of the Elements