


# IONIC BONDING

## 3.1

 In this worksheet you will learn more about the electrons in the outermost shell and how they help to hold different elements together.

In the Topic 2 worksheets you learnt about the numbers of electrons in the outermost shell. These outermost shell electrons are called valence electrons. Valence electrons are the electrons that join different elements together. Chemicals joining together is called bonding. This worksheet is about a kind of bonding called ionic bonding.

In ionic bonding the first thing that happens is ions are made. An ion is an atom or group of atoms with a charge on it.

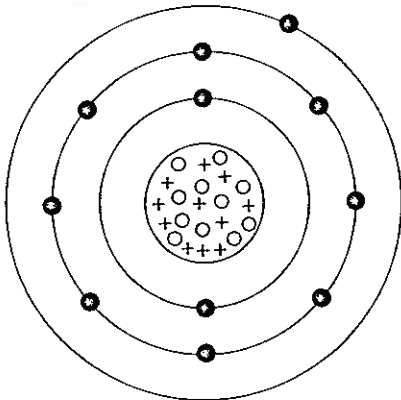
 **special words**

outermost shell  
valence electron  
bonding  
ionic bonding  
ion

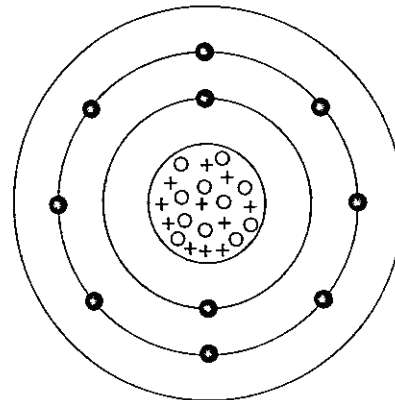
### To do



Atom



Atom with +1 charge



● = electrons  
+ = protons  
○ = neutrons

|                     |    | Charge   |
|---------------------|----|----------|
| Number of electrons | 11 | -11      |
| Number of protons   | 11 | +11      |
| Number of neutrons  | 11 | 0        |
| <b>Total charge</b> |    | <b>0</b> |

|                     |    | Charge    |
|---------------------|----|-----------|
| Number of electrons | 10 | -10       |
| Number of protons   | 11 | +11       |
| Number of neutrons  | 11 | 0         |
| <b>Total charge</b> |    | <b>+1</b> |

- 1 Look at the drawing of the atom. The two parts show the same atom but in the right-hand one the single outermost electron is missing. The atom now has a full outermost shell and a charge of +1.
- 2 If the atom has a +1 charge, what do you think will happen if an atom with a charge of -1 comes near? Write down what you think will happen.

---

---

---

---

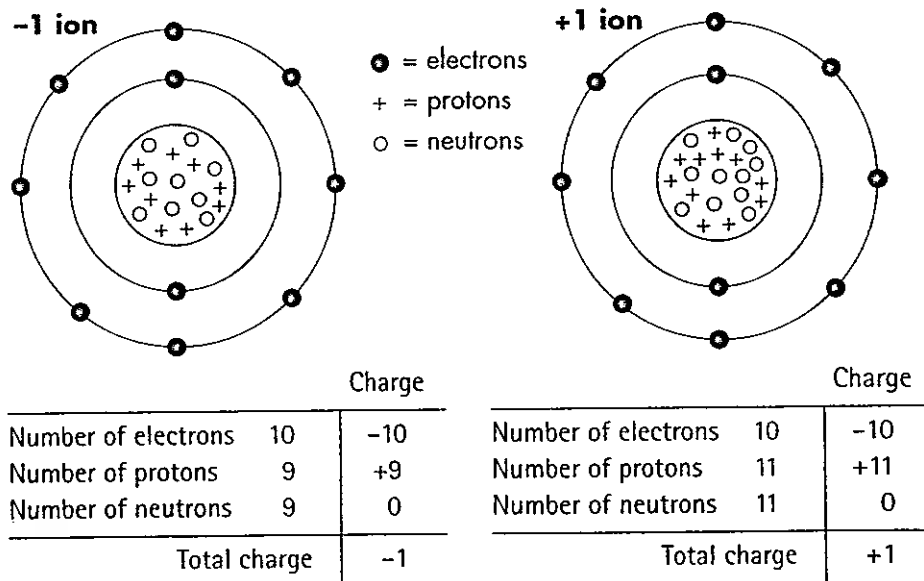
---

---

---

---

## 3.1



The drawings show atoms with a +1 and a -1 charge.

Ionic bonding happens between elements on the left-hand side of the periodic table and elements on the right-hand side of the periodic table.

Left-hand side elements lose electrons and make positive ions.

Right-hand side elements gain electrons and make negative ions.

In ionic bonding the positive and negative charges cancel each other out. All elements that bond like this try to have the outermost shell full, either by gaining electrons or by losing electrons.

### To do



- 1 Look at the two ions on this page. In your workbook try to draw these two ions in an ionic bond. Show all the outermost electrons and any positive or negative charges on the atoms.
  - 2 Look at the periodic table from the last worksheets and find the names of the two elements that you have drawn. Hint: Use the number of protons or atomic number to find the elements. Write the names of these elements under your drawings.
  - 3 Look at the periodic table and find the elements oxygen and magnesium.
  - 4 Write down the chemical symbols of each one.
- 
- 5 In your workbook draw the atoms, showing the outermost electrons.
  - 6 Can you see that magnesium has two electrons in the outer shell and oxygen has two spaces in the outer shell? Draw what you think an ionic bond between magnesium and oxygen would look like. The substance made in this ionic bond is called magnesium oxide. You may need to share your ideas with a partner or the teacher before you do the drawing.