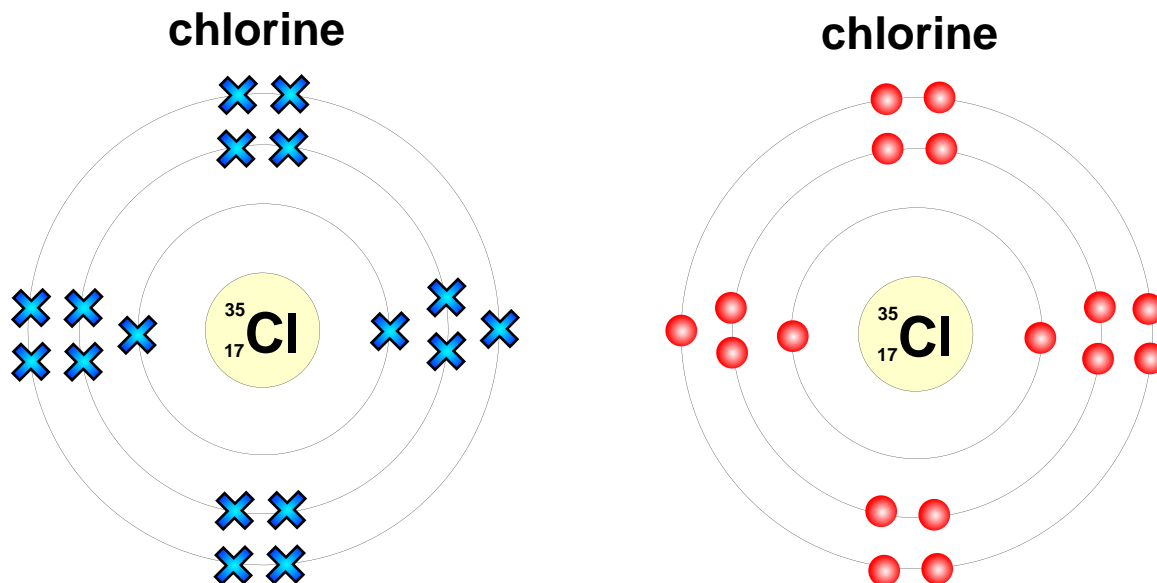


Covalent and ionic bonding

Question 2

The diagram below illustrates two separate chlorine atoms (i.e. they haven't bonded with each other yet):



- How many electrons has a chlorine atom got in its outer shell?
- What group of the periodic table is chlorine in?
- How many more electrons does chlorine need to have a full outer shell?

Two chlorine atoms will bond together and form a chlorine molecule. The only way both chlorine atoms can get full outer shells is if they each share an electron.

- What is the name of the type of bond formed when two atoms share electrons with each other?
- In the space below draw a dot and cross diagram to illustrate the covalent bond in the Cl_2 molecule?

- Which of the following are most likely to form covalent bonds with each other:
metals reacting with non-metals or **non-metals reacting with non-metals**?

Covalent and ionic bonding (Answers)

Question 1

- (a) How many electrons has sodium got? **11**
(b) How many protons are in a sodium nucleus? **11**
(c) How many electrons has chlorine got? **17**
(d) How many protons are in a chlorine nucleus? **17**
(e) What is the charge on each of these atoms? **none, neutral, zero, 0**
(f) How many electrons does sodium have in its outer shell? **1**
(g) How many electrons does chlorine have in its outer shell? **7**

Now suppose the sodium atom loses an electron to the chlorine atom:

- (h) Now what is the charge on the sodium particle? **1+**
(i) Now what is the charge on the chlorine particle? **1-**
(j) What do we call these charged particles? **ions**
(k) Will the charged sodium and chlorine particles repel or attract each other? **attract**
(l) How many electrons does the sodium particle have in its outer shell now? **8**
(m) How many electrons does the chlorine particle have in its outer shell now? **8**
(n) What is the name of the bond formed when electrons are transferred from one atom to another? **ionic**

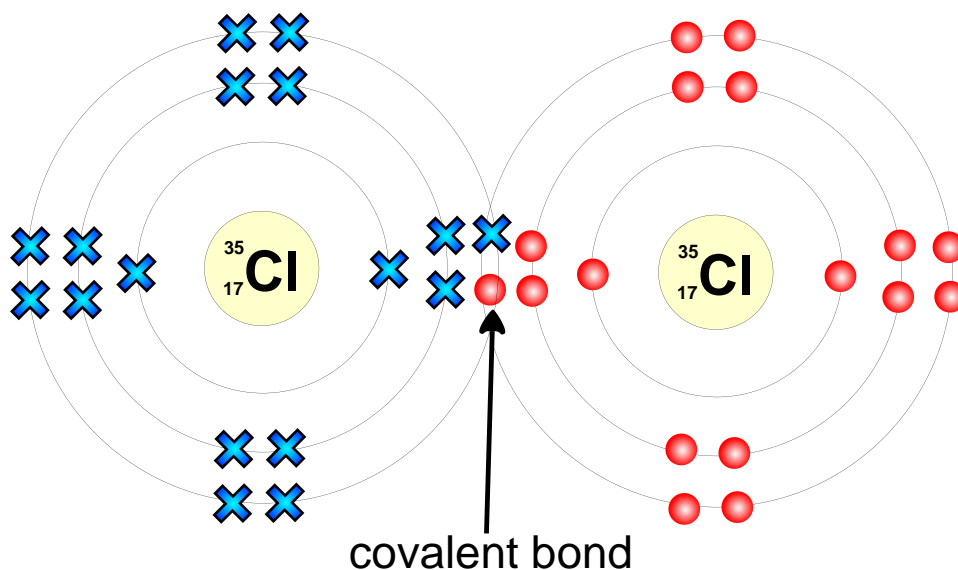
Question 2

- (a) How many electrons has a chlorine atom got in its outer shell? **7**
(b) What group of the periodic table is chlorine in? **7**
(c) How many more electrons does chlorine need to have a full outer shell? **1**

Two chlorine atoms will bond together and form a chlorine molecule. The only way both chlorine atoms can get full outer shells is if they each share an electron.

- (d) What is the name of the type of bond formed when two atoms share electrons with each other? **covalent**
(e) In the space below draw a dot and cross diagram to illustrate the covalent bond in the Cl₂ molecule?

A chlorine molecule



- (e) Which of the following are most likely to form covalent bonds with each other: metals reacting with non-metals or non-metals reacting with non-metals? **non-metals reacting with non-metals**