Science Mastery

Section A:

1. Match each key word with the correct definition.

| | |
|---|---|
| Element | A substance made from only one type of atom |
| Atom | A negatively charged, sub-atomic particle that orbits the nucleus of an atom |
| Ion | A charged particle. It can have a positive or negative charge. |
| Electron | The smallest part of an element than can exist |

Write the correct words in the gaps to complete the sentences.

- *When a metal atom **loses** an electron a _____ charged ion is formed.*
- *When a non-metal atom **gains** an electron a _____ charged ion is formed.*

2. Describe ionic bonding, giving an example.

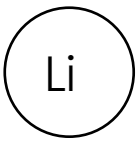
_____

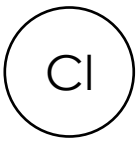
_____

_____

3. Lithium and chlorine react to form the ionic compound, lithium chloride.

(a) Complete the diagram below to show the electronic configuration of a lithium atom and a chlorine atom.



(b) State the number of valence electrons (in the outer shell) in the lithium and chlorine atoms.

Lithium valence electrons _____

Chlorine valence electrons _____

(c) State which groups these elements are found in the periodic table.

Lithium is in group _____ of the periodic table.

Chlorine is in group _____ of the periodic table.

(d) Describe the relationship between the number of valence electrons and the periodic table group. Use examples in your description.

_____
_____
_____

(e) Explain why the noble gases can be said to be in group 8 and group 0 of the periodic table.

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Section B

1. This question is about sodium chloride.
   (a) Explain why sodium chloride has a very high melting point.

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   _____
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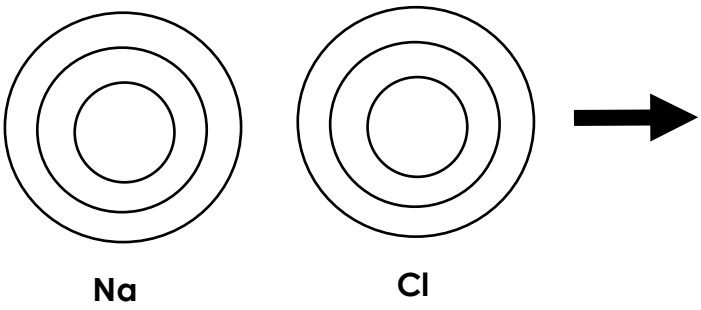
   (b) Explain how a sodium atom is different to a sodium ion.

   _____
   _____

   (c) State how many valence electrons sodium and chlorine have.

   _____

   (d) Complete the diagram below to show the ionic bonding between sodium and chlorine.




   (e) Describe, in terms of electrons, what happens when a sodium atom reacts with a chlorine atom to produce sodium chloride.

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