# CAIE Chemistry IGCSE

## 2.4 Ions and ionic bonds

Flashcards

# How is a cation formed?

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The loss of an electron from a metal results in a positively charged ion, known as a **cation.**

# How is an anion formed?

# How is an anion formed?

The gain of an electron to a non-metal results in a negative charged ion, known as an **anion**.

# What is an ion?

# What is an ion?

An ion is an atom or molecule with an electrical charge, due to the loss or gain of an electron

# How is an ionic bond formed?

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Ionic bonds form between a cation and anion, this bond is a strong electrostatic attraction between the oppositely charged ions

# Using a dot and cross diagram, show the formation of sodium chloride

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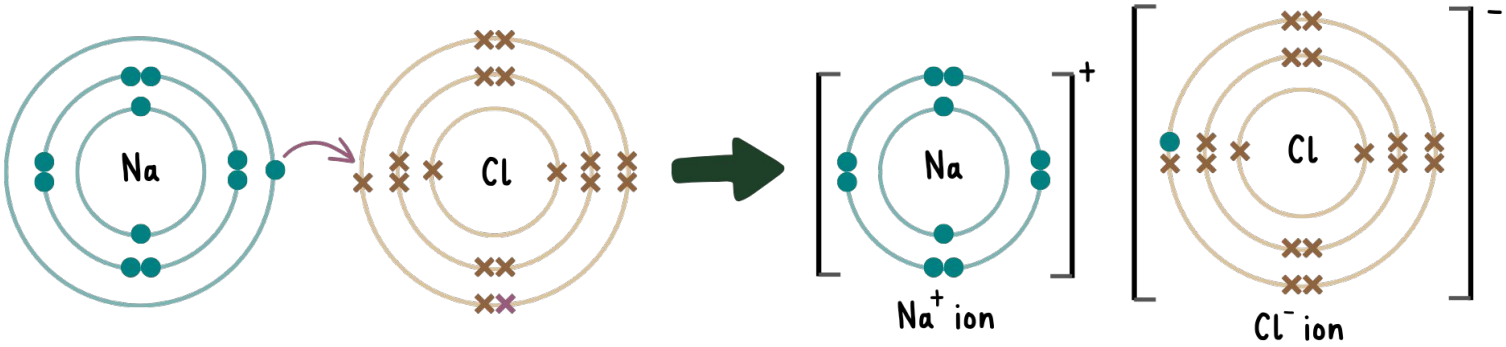

# Describe the melting and boiling point of ionic compounds

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Ionic compounds have high melting and boiling points

# Describe the electrical conductivity of ionic compounds in molten and solid state

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- In molten: Good electrical conductivity
- In solid: Poor electrical conductivity/ Cannot conduct electricity

# Describe the structure of ionic compounds (extended only)

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An ionic compound has a giant lattice structure which means the cations and anions are arranged alternately.

The ionic lattice is held together by strong electrostatic forces of attraction (ionic bonds) between the cations and anions.

Describe how a group 1 metal would form an ionic bond with a group 6 non-metal (extended only)

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Group 6 atoms have 6 outer shell electrons so need 2 more to fill the shell. Two group 1 atoms transfer their 1 outer shell electrons, so the ionic bond forms between the two group 1 cations and the group 6 anion.

Describe how a group 2 metal would form an ionic bond with a group 7 non-metal (extended only)

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Group 2 metals have 2 outer shell electrons so transfers (loses) each electron to 2 group 7 non-metal atoms (so each gains 1 electron). The ionic bond forms between the group 2 cation and the two group 7 anions

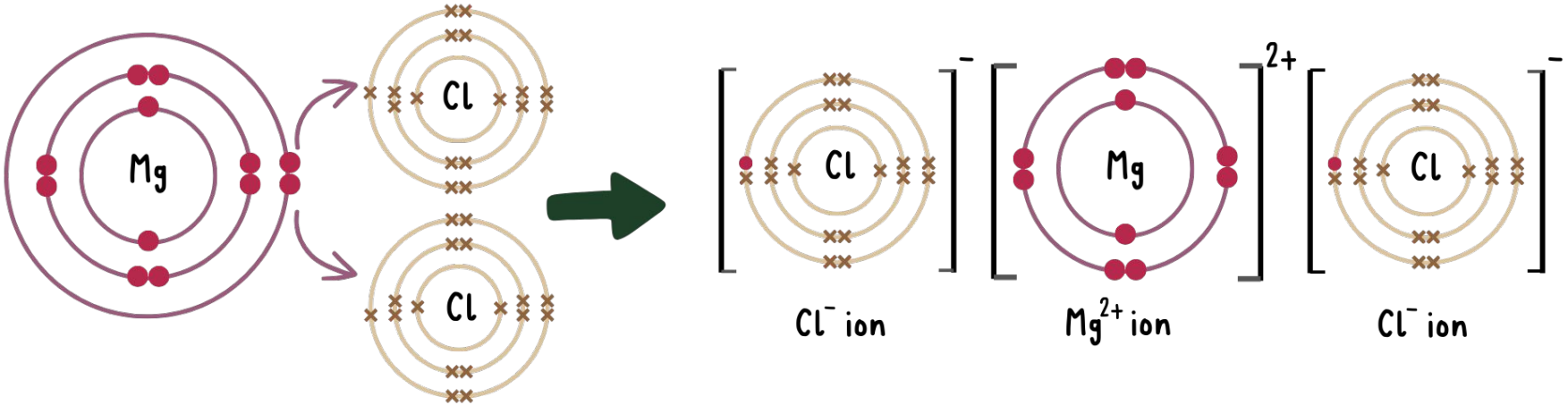
Describe how a group 2 metal would form an ionic bond with a group 6 non-metal (extended only)

# Describe how a group 2 metal would form an ionic bond with a group 6 non-metal (extended only)

Group 2 metals have 2 outer shell electrons so transfers (loses) both electrons to a group 6 non-metal atom (has 6 outer shell electrons). The ionic bond forms between the group 2 cation and group 6 anion

# Using a dot and cross diagram, show the formation of magnesium chloride (extended only)

# Using a dot and cross diagram show the formation of magnesium chloride (extended only)



# Explain why ionic compounds have high melting and boiling points (extended only)

# Explain why ionic compounds have high melting and boiling points (extended only)

Ionic compounds have a giant ionic lattice structure with many ionic bonds. These bonds have very strong electrostatic forces of attraction so need lots of energy to overcome them

Explain why ionic compounds have good electrical conductivity in molten/dissolved state (extended only)

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In molten/dissolved state, the ions are no longer fixed in position and are free to move to carry charge

# Explain why ionic compounds have poor electrical conductivity in solid state (extended only)

# Explain why ionic compounds have poor electrical conductivity in solid state (extended only)

In solid, the ions are fixed in position and are unable to move to carry charge, so solid ionic compounds cannot conduct electricity