

1h - Metallic bonding

Edexcel IGCSE Chemistry Revision Notes

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How to use these notes

These notes cover everything you need to know for this part of the specification. They have been written in question-answer format to make them easier for you to study from.

In order to study successfully, I recommend you do the following for each question and answer:

- Read it carefully and make sure you **understand** it.
- **Memorise** the answer.
- **Practice** applying your understanding to past exam questions.

A good way to memorise information is to use **retrieval practice**. This is when you practise retrieving information from your memory. You could do this by making a flashcard for each question with the question on one side and the answer on the other. Or you could use a flashcard app. Alternatively, use a sheet of paper to cover up the answer so you can only see the question. Try to answer the question and then check how you did.

You should practise retrieving each answer from your memory until you can do it perfectly. Even once you can retrieve the answer perfectly, your ability to retrieve it will probably fade as time passes without practising. Therefore you will need to keep going back to the questions that you have previously mastered and practising them again. However, each time you re-learn the answer, the memory will be stronger and will last longer than the time before.

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What is a delocalised electron?

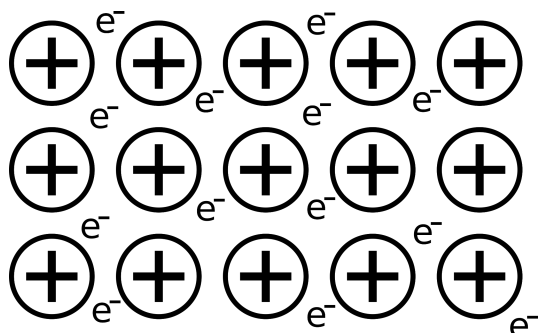
A delocalised electron is an electron that is free to move around. It is not part of an atom or ion.

What is the structure of a metal?

A metal is made up of a lattice of metal cations surrounded by a sea of delocalised electrons. This is called metallic bonding.

How do you draw a 2-dimensional diagram to represent the structure of a metal?

A 2-dimensional diagram to represent the structure of a metal is drawn as shown below. The circles with plus signs (+) in them represent the metal cations and the e^- symbols represent the delocalised electrons.



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In metallic bonding, what holds the structure together?

In metallic bonding, the structure is held together by forces of electrostatic attraction between the positively charged metal cations and the negatively charged delocalised electrons.

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In order for a substance to conduct electricity, what must it contain?

In order for a substance to conduct electricity, it must contain charged particles that are free to move around.

Why do metals usually conduct electricity?

Metals usually conduct electricity because they contain delocalised electrons. Delocalised electrons are charged particles (they are negatively charged) and they are free to move around. Therefore, the delocalised electrons can carry an electric current through the metal.

What does it mean if a substance is described as 'malleable'?

If a substance is described as 'malleable' this means that it can be easily hammered or pressed into shape without breaking.

Why are metals usually malleable?

Metals are usually malleable because the metal cations are arranged in layers and these layers can easily slide over each other, allowing the metal to take on a new shape.