1d - The periodic table

Edexcel IGCSE Chemistry Revision Notes

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.

1.18

What is the periodic table?
The periodic table is a table that lists all of the known chemical elements.

What are the elements in the periodic table listed in order of?
The elements in the periodic table are listed in order of increasing atomic number.

What are the rows in the periodic table called?
The rows in the periodic table are called periods.

What are the columns in the periodic table called?
The columns in the periodic table are called groups.

1.19

What is electronic configuration?
Electronic configuration is the arrangement of electrons within an atom of ion. It is written as a list of numbers separated by commas. The first number is the number of electrons in the first shell, the second number is the number of electrons in the second shell and so on.

What does the period that an element is in tell us about the electronic configuration of an atom of that element?
The period that an element is in tells us how many shells an atom of that element has (e.g. if the element is in the third period then an atom of the element has three shells).

What does the group that an element is in tell us about the electronic configuration of an atom of that element?
The group that an element is in tells us how many electrons an atom of that element has in its outer shell (e.g. if the element is in Group 6, then an atom of that element has 6 electrons in its outer shell).

What is the maximum number of electrons that can be in each of the first three shells?
The maximum number of electrons that can be in each of the first three shells is as follows:

- First shell: 2
- Second shell: 8
- Third shell: 8

How can you work out the electronic configuration of an atom of one of the first 20 elements from the element's position in the periodic table?
You can work out the electronic configuration of an atom of one of the first 20 elements by looking at what period and group the element is in. The period number tells you how many shells the atom has. All the shells before the outer shell will contain the maximum number of electrons they can contain. The group number tells you how many electrons are in the outer shell.

Example: Workout out the electronic configuration of a silicon atom

The element silicon is in period 3 and group 4.

The fact that silicon is in period 3 tells us that a silicon atom has 3 shells.

The fact that silicon is in group 4 tells us that a silicon atom has 4 electrons in the outer shell.

All of the shells before the outer shell will contain their maximum number of electrons,

which is 2 for the first shell and 8 for the second shell.

Therefore, a silicon atom has the electronic configuration 2,8,8.

1.20

What are some of the properties of non-metals?
Some of the properties of non-metals are as follows:

- Non-metals do not usually conduct electricity.
- Non-metal oxides (compounds formed when non-metals bond to oxygen) are usually acidic.

What are some of the properties of metals?
Some of the properties of metals are as follows:

- Metals usually conduct electricity.
- Metal oxides (compounds formed when metals bond to oxygen) are usually basic (the opposite of acidic).

1.21

Where are non-metals located in the periodic table?
Non-metals are located towards the top and the right of the periodic table.

Where are metals located in the periodic table?
Metals are located towards the bottom and the left of the periodic table.

1.22

[This is already covered in 1.19]

1.23

What is meant by the 'chemical properties' of an element?
The chemical properties of an element refers to the types of chemical reactions that the element takes part in.

What can be said about the chemical properties of elements in the same group?
Elements in the same group usually have similar chemical properties.

Why do elements in the same group have similar chemical properties?
Elements in the same group have similar chemical properties because they have the same number of electrons in their outer shell.

1.24

What happens to an atom's outer shell when it takes part in a chemical reaction?
When an atom takes part in a chemical reaction, its outer shell usually gains or loses electrons.

Why do the elements in Group 0 not readily react?
The elements in Group 0 do not readily react, because atoms of those elements already have a full outer shell. Having a full outer shell is a very stable arrangement. Since atoms of Group 0 elements already have a full outer shell, they do not need to gain or lose electrons and therefore they do not readily react.

What are the elements in Group 0 also known as?
The elements in Group 0 are also known as the noble gases.