



Name.....

## A level Chemistry Preparatory Work for Atomic Structure Topic

Use the "Atomic Structure" PowerPoint at <https://moodle.solihullsf.ac.uk/course/view.php?id=527> or <https://chemrevise.files.wordpress.com/2018/05/1-1-revision-guide-atom.pdf>

**Do NOT use your GCSE notes.** You probably will not have a college username and password, login as a "guest" if prompted.

**You will need to bring to your first lesson:** a ring binder A4 folder, a highlighter, a pen, a pencil, lined paper, a ruler, a scientific calculator.

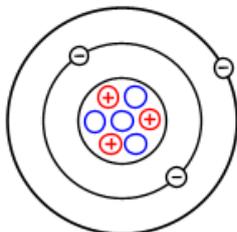
### Fundamental Particles

	Relative mass	Relative Charge

Atoms are **neutral** particles they have no overall charge.

Complete: In an atom number of protons = number of .....

This atom



is fully represented as



3 is called the **atomic number (Z)**

7 is called the **mass number (A)**

Label the nucleus.

Write the (GCSE) electron configuration for this atom .....

Define **Atomic number**

Define **Mass number**

How would you calculate the number of neutrons from the atomic number and the mass number?

Number of neutrons =

What are atoms like?

## Isotopes

Examples of isotopes of hydrogen are:  $^1\text{H}$   $^2\text{H}$   $^3\text{H}$

Notice there is no need to give the atomic number the element symbol tells you what this is anyway.

Define **isotopes** in terms of numbers of fundamental particles.

Another element with isotopes is chlorine (use the Periodic Table to find the number of protons).

	Number of		
	protons	neutrons	electrons
$^{35}\text{Cl}$			
$^{37}\text{Cl}$			

Write the (GCSE) electron configuration for chlorine .....

Chlorine is a halogen which group of the periodic table does it belong to?

.....

How does the group number relate to the electronic configuration?

.....

The **CHEMICAL properties of isotopes of the same element** like  $^{35}\text{Cl}$  and  $^{37}\text{Cl}$  are always **IDENTICAL** because.....

## Ions

- An ion is a ..... particle.
- The number of ..... and ..... are NOT equal.
- When an atom loses one or more ..... it forms a ..... charged ion called a ..... Give an example .....
- When an atom gains one or more ..... it forms a ..... charged ion called an ..... Give an example .....
- Often ions have electron arrangements with a full outer shell like the ..... gases which should be stable.

# The Mass Spectrometer

A mass spectrometer is a machine used to analyse atoms and molecules.

**Use the “Mass Spectrometer” PowerPoint at**

<https://moodle.solihullsfsc.ac.uk/course/view.php?id=527>

to answer the following questions.

**You can either answer the questions on a separate piece of paper or design a poster.**

1. What information about atoms or molecules can be found using a Mass Spectrometer?
2. List the four processes which occur in a Mass Spectrometer.
3. Describe how ionisation occurs.
4. Describe how ions are accelerated.
5. Ions are separated according to their  $m/z$ . What does the symbol  $m/z$  stand for?
6. Describe how ions detected.
7. Look at the mass spectrum of molybdenum on the PowerPoint. This is how the Mass Spectrometer machine displays the information it finds.

Find a **different** example of a mass spectrum of an element using the following link

<http://www.chemguide.co.uk/analysis/masspec/elements.html#top>

Sketch one example of a spectrum you have found using this link.