

Atomic Structure & Notation

Three types of particle make up an atom:

Particle	Relative Mass*	Charge	location
proton			
neutron			
electron			

* a.m.u. = atomic mass units

Neutral atoms have equal numbers of _____ and _____ charged particles.
If you are not told otherwise, usually assume an atom is neutral.

There are **different variations** of neutral lithium atoms.

One atom has:
3 protons and 3 neutrons

Another atom has
3 protons and 4 neutrons

Total mass = _____ a.m.u

Total mass = _____ a.m.u

Atoms of the same element which differ in mass are called _____.

Both isotopes of lithium have the same number of _____.

Nuclide Notation

Sometimes nuclide notation is used to represent which isotope of an element is present.
In nature, elements are found as mixtures of different isotopes.

The atomic number of an atom is the number of _____ in the nucleus.

The mass number of an atom is the total number of particles in the nucleus, i.e.

_____ + _____.

This boron atom has ____ protons and ____ neutrons.

Mass number \longrightarrow 10
Atomic number \longrightarrow 5 **B**

This boron atom has ____ protons and ____ neutrons.

Mass number \longrightarrow 11
Atomic number \longrightarrow 5 **B**

Working Out Numbers

Here you will work out numbers from the nuclide notation and vice versa. If there is no + or – sign next to a symbol then assume that the atom is neutral—**equal numbers of positive and negative charges**.

Nuclide Symbol	Atomic number	Number of protons	Overall Charge	Number of electrons	Mass number	Number of neutrons
C	6					6
Na	11		+1		22	
		9				10
				17	35	

Summary:

In neutral atoms:

- Number of protons = _____
- Number of electrons = _____
- Number of neutrons = _____ number - _____ number

Look at the atomic masses listed in the periodic table. Describe the trends you notice in numbers of neutrons as atomic mass increases. Why do you think the numbers of neutrons are not whole numbers?
