

Parts of the Atom

Nucleus: center of the atom, contains protons and neutrons

Energy level: outside of the nucleus where you are likely to find electrons

Protons: have a positive charge (+)

Electrons: have a negative charge (e⁻)

Neutrons: have no charge (neutral)

The number of protons determines to what element the atom belongs (e.g. 8 protons means it's an atom of oxygen, 10 protons means it's an atom of neon).

The atomic number is equal to the number of protons in 1 atom of that element.

Atoms are neutral; they must contain equal numbers of protons and electrons.

To find the number of neutrons in an atom, round the atomic weight to the nearest whole number. Then subtract the atomic number from the atomic weight.

Diagram of a Lithium (Li) Atom:

The first energy level is full with 2 electrons. The second energy level is full with 8 electrons. The 3rd energy level can hold a maximum of 18 electrons.

Atoms like to exist with complete outermost energy levels. To achieve this, atoms lose or gain electrons, becoming ions.

Example: Lithium has to either gain 7 electrons or lose 1 electron to get a full outermost energy level. Which is easier? Losing 1 electron!

Diagram of a Lithium Ion (Li⁺)

Take a look at oxygen and do the same thing.

Oxygen Atom:

Oxygen Ion (O⁻²)

Oxygen can either lose 6 electrons or gain 2 electrons. It's much easier to gain 2 electrons. When this happens, oxygen picks up a -2 charge as an ion.

Try to determine what Magnesium does – its symbol is Mg. The atomic number is 12, so that means 12 protons and 12 electrons in the Mg atom. The atomic weight rounds to 24. After you subtract the number of protons from 24, you end up with 12 neutrons.

Mg Atom:

Magnesium's 12 electrons require use of the 3rd energy level. There are only 2 electrons in this level and it's much easier to lose those 2 electrons than to gain 16 more electrons. So the Mg ion looks like this:

Mg Ion:

The symbol for this ion is : Mg^{+2}