***Bohr-Rutherford Diagrams***

*Parts of the Atom*

1. Proton – positive particle in the nucleus \*\*Each element has a unique # of protons!
2. Neutron – neutral particle in the nucleus
3. Electron – negative particle outside the nucleus

**Reminders…..**

The number of protons is the atomic number of an element.

The number of protons = the number of electrons in an atom.

The number of neutrons is found by taking the atomic mass and subtracting the atomic number.

Bohr-Rutherford Diagrams

Show the placement of electrons in the orbits around the nucleus of an atom.

Place electrons in the orbits closest to the nucleus first, when the orbit is full, move on to the second orbit.

An atom is sometimes represented as Be-9. This means that this atom has a mass number of 9. Mass number is the total number of protons and neutrons. Beryllium always has 4 protons, so this atom must have 5 neutrons.

The noble gases are now for their stability. Chemists infer that the outer orbit of an element is responsible for the element’s reactivity. Since the noble gases all have completely filled outer orbits, we can conclude that there is something stable about full outer orbits.

It is also important to understanding how elements combine to form compounds.

***Compounds*** – are substances made up of two or more elements in a fixed ratio.

***Atoms and Ions***

***Ion*** – a charged particle that results when an atom gains or loses one or more electrons.

For example, magnesium atoms lose two electrons when they react with other atoms. Each resulting with magnesium ion contains 12 positive charges (protons) and 10 negative charges (electrons). The magnesium ion has an ionic charge of +2. Other elements in the Alkaline Earth Metals family also have an ionic charge of +2.

**Practice:** Try to figure out the ionic charge for the Alkali metals, halogens, and noble gases!

**Alkali Metals Halogens Noble Gases**

Why do we not find magnesium with a +1 charge?

Which is more stable? An atom of lithium or an ion of lithium?

***Practice:***

1. Draw Bohr-Rutherford diagrams for an atom and ion of **Postassium**
2. Draw Bohr-Rutherford diagrams for an atom and ion of **Chlorine**
3. What do you notice about both of these ions?