

Chemistry Review

Notes:

Atomic theory - Review

- Many different scientists' discoveries have come together to form our understanding of the atom and how an atom works.
- Parts of the atom are called sub atomic particles
 - 1.) Protons - positively charged particles (1836 times heavier than electrons)
 - 2.) Neutrons - neutrally charged particles (1837 times heavier than electrons)
 - 3.) Electrons - Negatively charged particles (mass of 1)
 - 4.) Nucleus - center of atom and contains protons and neutrons (99% of atoms mass)
- Atoms come in different types just like flavors of lollipops.
- There are 92 types of atoms that occur naturally.
- Each type of atom is different and is called an element. Ex. - gold has 79 protons and is the only atom with 79 protons. So, gold is an element.
- What kind of atom you are is decided by how many protons you have. Ex. - Hydrogen has 1 proton and Carbon has 6 protons.
- Electrons "zip" around the nucleus because they are attracted (pulled) by the positive charge of the nucleus from the protons.
- A neutral atom has the same number of protons and electrons. Ex. - Hydrogen has 1 proton so it has one electron or Carbon has 6 protons so it has 6 electrons.
- Positive and negative charges are attracted. Like repel!

Notes:

- **Periodic table**
 - Periodic Table - a chart that organizes elements by common physical and chemical properties.
 - Characteristics of each element -
 - 1.) Atomic Number - the amount of protons in the nucleus of the element. The elements increase in order of 1 proton from left to right, top to bottom.
 - 2.) Atomic Mass - the average mass of protons and neutrons added together. This follows the same pattern as the protons.

3.) Ion Charge - the charge the element likes to form by losing or gaining electrons. Elements on the left form positive ions and elements on the right form negative ions. As you go down columns each element has the same ion charge (generally).

More patterns of the periodic table notes

- Metals are found on the left and non-metals are found on the right side.
- Metalloids are elements that act like either metals or non-metals and are found in-between the metals and non-metals.
- Periods - are rows going horizontally on the periodic table.
- Families - columns going vertically on the periodic table.
- Families of elements (vertical columns) tend to react the same and have the same properties.
- Family one - Alkali metals - All form +1 ions and are **VERY** reactive.
- Family two - Alkaline Earth metals - All form +2 ions and are reactive but not as much as Alkali.
- Family three to twelve - Transition metals - stable metals that often form multiple ions.
- Family seventeen - Halogens - All form -1 ions and are **VERY** reactive. All are poisonous!
- Family eighteen - Noble gases - All do NOT react.

Notes:

Connecting the periodic table and atomic theory

- The periodic table has patterns in how the elements are listed. As you go down families the ARRANGEMENT of the electrons are the same and that is why all of the elements act the same. Let's look at this phenomenon.
- We draw atoms most commonly as Bohr models. Bohr models show the arrangement of the electrons and where they are found around the nucleus. The "rings" or "orbitals" where electrons are found are called electron shells.
- You are allowed up to 2 electrons in the first shell, up to 8 in the second shell, up to 8 in the third shell, and up to 18 in the fourth. - Ex. - Draw helium, boron, and sodium.
- Any shell that does not have the maximum amount of electrons is called a valence shell and the electrons in that shell are called valence electrons.