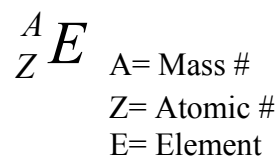


Counting the Number of Neutrons in an Atom

Chlorine has two isotopes. If you know the atomic number and the mass number of an atom you can easily calculate the number of neutrons it has.



Oxidation

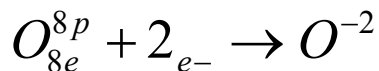
The oxidation number is the charge on an atom. When the oxidation is zero it means that there are the same amount of protons and electrons. Every element in nature starts out with a charge of zero.

Atoms will gain or lose electrons, whatever is easier, to become ions. **Cation** “+” **anion** “-“ Positive and negative ions are strongly attracted to each other, because *opposites attract*.

- Position on periodic table dictates behavior
- On periodic table, group # 1 are ⁺¹, group #2 are ⁺², and so on ... group #7 are ⁺⁷

Example: Mg²⁺ mono atomic ion- one distinct type

Oxygen is group VI, cation +6, anion -2



Transition Metals

Transition Metals are the elements that fill the center block in the Periodic Table. Most of them can form more than one kind of ion. They include many common metals, such as iron and copper. The atoms of transition metals, like all metals, can become more stable by losing electrons and forming positive ions. But most transition metals can become stable by losing **different numbers** of electrons. This means that they can form more than one kind of ion. Copper is a typical example. The copper atom can become stable by losing either one or two electrons. If it loses one electron, it forms an ion with a single positive charge, Cu⁺. This ion is called **copper (I)**. If it loses two electrons, it forms an ion with a double positive charge, Cu⁺². This ion is called **copper (II)**.

Each chloride ion has a single negative charge Cl⁻. Copper (I) ions have a single positive charge, so these two types of ion will combine together in equal numbers to form the ionic compound CuCl. This compound is called **copper (I) chloride**. Copper (II) ions, however, have a double positive charge Cu²⁺. So *two* chloride ions are needed to combine with each copper (II) ion. The ionic compound formed has the formula CuCl₂. It is called **copper (II) chloride**.

Most of the compounds of transition elements are colored. The colors are often different for the different kinds of ions formed by one metal. Copper (II) compounds, for example, are often blue, while copper (I) compounds are often white or green.

Iron is another important transition metal. It forms two sorts of ion, Fe²⁺ and Fe³⁺. These are called **iron (II)** and **iron (III)**. Iron (II) compounds are usually pale green, while iron (III) compounds are usually yellow or brown.