Concept 4.2
Chemical properties are based on the structures of atoms

ATOMS:

Each element consists of a single kind of atom that is different from the atoms of all other elements.

Atom - the smallest possible particle of an element

Atoms of all element are made up of even smaller components called subatomic particles.

Proton - (+) positive electrical charge
Electron - (-) negative electrical charge
Neutron - electrical neutral (no elec. charge)

An element's physical and chemical properties depend on the number and arrangement of its subatomic particles.

Nucleus - the central core where the protons and neutrons are tightly packed together

Electrons continually move about the outside of the nucleus at great speed . The attraction between negatively charged electrons and the positively charged protons keeps the electrons close to the nucleus.

An important difference among elements is the number of protons in the atoms. All atoms of a particular element have the same number of protons, which is known as the **atomic number.** The number of protons determines the atoms properties. No two elements have the same atomic number **(proton number).**

Atoms tend to hold as many electrons as protons and is electrically neutral. (+) charged protons balance the (-) charged elections

However electrons can be lost or gained by certain atoms.

Isotopes : which have an alternate form

Isotopes have the same number of protons in their atoms but differ in numbers of neutrons.

Radioactive isotopes - an unstable isotope in which the nucleus decays over time, giving off radiation in the form of matter and energy.

Electrons and Reactivity

- Electrons differ in the amount of energy they have and how tightly they are held by the protons in the nucleus.

- Electrons in the highest energy level determines how the atom reacts.

- The lowest energy level (nearest the nucleus) can hold 2 electrons while the second can hold 8 electrons.

- A partly-filled energy level makes the atom chemically reactive.