

2. Blocks of the periodic table
 - a. s-block- chemically reactive metals of groups 1 and 2.
 - i. Group 1 contains *alkaline metals*; group 2 contains *alkaline-earth metals*.
 - b. d-block- metals with typical metallic properties.
 - i. Good conductors with high luster.
 - c. p-block- all the elements of groups 13-18 except helium.
 - i. The p-block elements together with the s-block elements are called the main-group elements.
 - d. f-block- wedged between groups 3 and 4 in the sixth and seventh periods. Lanthanides and actinides.
 - i. Lanthanides are shiny metals similar in reactivity to the group 2 alkaline-earth metals.
 - ii. The actinides are all radioactive. The first four have been found naturally on Earth; the remaining actinides are only known as laboratory-made elements.

Atomic Radii

1. Atomic radius may be defined as one-half the distance between the nuclei of identical atoms that are bonded together.
 - a. The trend to smaller atoms across a period is caused by the increasing positive charge of the nucleus.
 - b. In general, the atomic radii of the main-group elements increase down a group.

Ionization Energy

1. An electron can be removed from an atom if enough energy is supplied. Using A for the symbol of any element, the process can be expressed as follows.

$$A + \text{energy} \rightarrow A^+ + e^-$$
 - a. Ion: an atom or group of bonded atoms that has a positive or negative charge.
 - i. Ionization: any process that results in the formation of an ion.
 - ii. Ionization energy, IE: the energy required to remove one electron from a neutral atom of an element.
 - iii. In general, ionization energies of the main group elements increase across each period, and ionization energies decrease down the groups.
 - iv. The energy for removal of additional electrons from an atom are second ionization energy, third ionization energy, and so on. Each successive electron removed from an ion feels an increasingly stronger effective nuclear charge (nuclear charge - electron shielding).

Electron Affinity

1. The energy change that occurs when an electron is acquired by a neutral atom is called the atom's electron affinity.
 - a. Most atoms release energy when they acquire an electron.

$$A + e^- \rightarrow A^- + \text{energy}$$
 - i. Some must be forced to gain an electron by the addition of energy.

$$A + e^- + \text{energy} \rightarrow A^-$$