

# Periodic Trends (436 only)

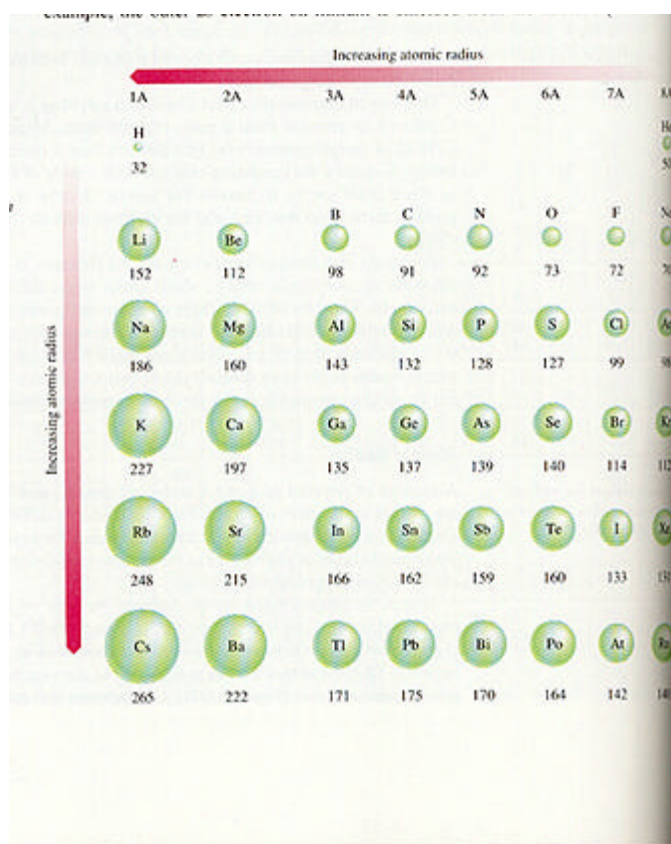
## Electronegativity

This is a measure of an atom's tendency to pull electrons towards itself while bonded to another atom. In a sense, it is a measure of greediness. The nonmetals, which are close to having a full energy level, are far more electronegative than metals.

Within any period, as atomic number increases, electronegativity decreases.

For the nonmetals, *within a family*, electronegativity *decreases* with increasing number. So fluorine, for instance, is the most electronegative halogen; in fact it is the periodic table's most electronegative atom.

## Atomic Volume or Radius



The above illustration reveals how, *within a family*, not surprisingly, atomic volume increases with increasing atomic number. But note that across a period (from left to right), atomic volume actually decreases. This is because additional nuclear charge is acting on the same number of shells.

## Melting Point and Boiling Points

For alkali metals, both melting points and boiling points decrease with increasing atomic

number. So Fr is the lowest-melting alkali metal.

For halogens, the trend reverses itself. Both melting points and boiling points increase with increasing atomic number. Hence at room temperature chlorine is a gas, but bromine is a liquid and astatine and iodine are still solids.

### **Ionization Energy**

Ionization energy is the amount of energy needed to remove an electron from an atom in its gaseous state.

With increasing atomic number within a family, ionization energy decreases. Within a period, ionization energy *increases* as one moves from left to right.