

IONIZATION ENERGIES

Figure 197 in textbook

- The more electrons in one shell, the poorer the shielding is which equals a higher effective nuclear charge
- Electron Affinity: The energy change that occurs when an electron is added to an isolated atom in the gaseous state
- Octet Rule: Main-group elements tend to undergo reactions that leave them with eight outer-shell electrons. That is, main-group elements react so that they attain a noble-gas electron configuration with filled s and p sub levels in their valence electron shell.
- Metals tend to have low ionization energies and low electron affinities (they tend to lose one or more electrons)
- Nonmetals tend to have high ionization energies and high electron affinities (they tend to gain one or more electrons)

ex: Sodium and Chlorine can react because sodium readily loses one electron and chlorine readily gains one electron



BORN-HABER CYCLE

- The sum of the energy changes for the five steps equals the net energy change for the overall reaction
- The most favorable step is the formation of solid NaCl from gaseous Na⁺ and Cl⁻ ions
- Lattice Energy: The amount of energy that must be supplied to break up an ionic solid into individual gaseous ions
- Lattice energy increases up and left

PROPERTIES OF ELEMENTS

- Alkali Metals
 - Powerful reducing agents
 - Metallic
 - Bright, silvery
 - Malleable
 - Good conductors of electricity
 - Relatively soft
 - Very reactive
 - Occur only in salts
- Alkaline Earth Metals

- Reducing agents
- Metallic
- Bright, silvery
- Relatively soft (harder than 1a)
- Not as reactive as 1a
- Occur only in salts