

Chapter 7

Periodic Properties of the Elements

Chapter 7 suggested problems
10th Ed. and 11th Ed. : none

Class Notes

I. Atomic properties and Periodic trends

A. Atomic size (atomic radius)

1. As we move down a group the number of shells - and hence the diameter - of the atom increases
2. As we move from left to right diameter decreases because there are more protons to hold the electrons
3. Any electrons between the nucleus and an electron reduce the effect of the nucleus on that electron
4. Effective nuclear charge: $Z_{\text{eff}} = Z - S$ (S = total inner shell electrons)

B. Metallic character - decreases as we move up groups and from left to right across a period

C. Ionization energy - the energy required to remove an electron from an atom

1. Ionization energy increases as we move up groups and from left to right across a period
2. As the number of electrons removed increases, ionization energy increases
3. IE values are nearly always positive - it always requires energy to remove electrons

D. Electron affinity - the energy required for an atom to gain an electron

1. Most p block elements have negative EA values
2. EA values become more negative as we move up groups and from left to right across a period

E. Electronegativity - the tendency of an atom to attract electrons to itself

1. EN values range from around 0.7 - 4.0
2. EN values increase as we move up groups and from left to right across a period

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