

03/10/14
Workshop 6
Chem. 103, Spring 2014
Chapter 6
(Full points 20)

Please complete the home-assigned problems to be submitted to your lab instructor in the week of 03/24/14-03/28/14

A. Electronegativity and bond polarity

- i) Short lecture
- ii) Electron affinity and electronegativity are related but different concept. Read page 189 and provide a concise rationale for the above statement.
- iii) Define bond polarity in your own words.
- iv) Read page 189 and fill the following table

| Bond type | Nonpolar | Polar covalent | Ionic |
|--------------|-----------|----------------|-----------|
| ΔEN | | | |
| Two examples | i) ii) | i) ii) | i) ii) |

- v) Discuss in groups to answer the following problems. 6.13, 6.14

Home-assigned problems.

6.16 and 6.17

B. Naming covalent compounds (short lecture)

- General rules
 - Make sure the compound qualifies as a covalent molecule (and not ionic)
 - Give the name of the least electronegative element first
 - Give the stem name of the more electronegative element, ending with “ide”
 - Indicate the number of each type of atom by the prefixes, mono, di, tri, tetra, penta, etc.
 - a) PCl_5 phosphorus pentachloride
 - b) SO_2 sulfur dioxide
 - c) N_2O dinitrogen monoxide
 - d) CO carbon monoxide
 - e) CO_2 carbon dioxide

Home-assigned problem.

Name the following covalent compounds: CCl_4 , NO , SeF_4 , $CaCl_2$, N_2O_4 , S_2O_7

C. Drawing Lewis Structure

A Systematic Approach

1. Identify the central atom based on electronegativities of the constituents atoms. The central atom is the one with low electronegativity value. **Exception: Hydrogen (always be the terminal atom)**
2. Recognize the number of bonds each atom should make to satisfy its octet
3. Determine the total number of valence electrons in the molecule.
4. Place one pair of electrons between each pair of bonded atoms to form a single bond.
5. Use any remaining pairs as lone pairs around each terminal atom (**except H**) so that each terminal atom is surrounded by eight electrons
6. If the central atom has fewer than eight electrons at this point, move one or more of the lone pairs on the terminal atoms into a position intermediate between the center and the terminal atom to form **double** or **triple bonds**

Discuss in groups to answer the following problems: 6.22, 6.23

Home-assigned problems. 6.24, 6.25