

Ch 7+8: Periodic Trends and Lewis Structures

November 15, 2022

Electron Configurations and Periodic Trends

- 1) Write the electron configuration for each ion: O^{2-} , Br^- , Sr^{2+} , Co^{3+} , Cu^{2+} , Cl^- , P^{3-} , K^- , Mo^{3+} , and V^{3+}
- 2) Consider these elements: N, Mg, O, F, Al.
 - a) Write the electron configuration for each element.
 - b) Arrange the elements in order of decreasing atomic radius.
 - c) Arrange the elements in order of increasing ionization energy.
 - d) Use the electron configurations in part a to explain the differences between your answers to parts b and c.
- 3) Explain why atomic radius decreases as we move to the right across a period for main-group elements but not for transition elements.

Lewis Structures

4) Draw the Lewis structure and determine the geometry for the following compounds: CH_4 , CH_3Cl , CH_2Cl_2 , CHCl_3 and CCl_4

- a) Determine which bonds are polar.
- b) Determine whether the molecule is polar.

5) Draw the Lewis structure for acetic acid (CH_3COOH)

- a) Determine which bonds are polar.
- b) Determine whether the molecule is polar.
- c) Draw the Lewis structure of the anion acetate (CH_3COO^-) and determine the formal charges on the atoms. Include all possible resonance structures.

6) Draw the Lewis structures, classify the geometry, determine which molecules are polar, and if nonpolar, explain why: CO_2 , SO_2 , SO_3 , BH_3 , and O_2