Homework Set 9 Solutions

(Distributed 11/9/16; Due on 11/9/16)

Read Chapter 12 in Zumdahl and complete the listed questions from the text: 12, 17, 26, 34, 39, 46. 59, 65, 68, 78, 82; as well as the following problems:

A. Write the symbols for four ions that are isoelectronic with Xe.

Te^{2-}, I^-, Cs^+, Ba^{2+}

B. Indicate the direction of the polarity in each of the following bonds:

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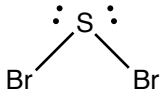
C–Cl	N–O	H–O

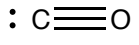
Which bond is expected to be the most polar? Why?

O-H is the most polar because the two atoms have the greatest difference in electronegativity

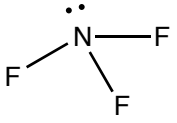
C. Draw Lewis dot structures for each of the following molecules:

(i) SBr_2 

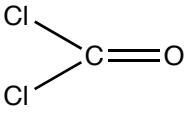
Bent or tetrahedral, 105°

(ii) CO 

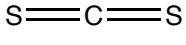
Linear, 180°

(iii) $\underline{N}F_3$ 

pyramidal or tetrahedral, 107°

(iv) $O\underline{C}Cl_2$ 

trigonal planar, 120°

(v) $\underline{C}S_2$ 

Linear, 180°

D. Indicate the expected shape and bond angles around the underlined atom for each of the molecules in part C

Problems from Zumdahl:

Chapter 12:

12 (a) At > Ba > Cs (b) Sr > Ba ≈ Ra (c) O > Mg > Rb

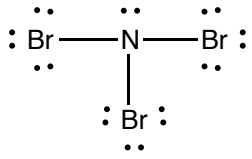
17. (a) H–F (b) H–Cl (c) H–Cl (d) H–Br

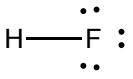
26.(a) S-→P (b) S→ F (c) S→ Cl (d) S→ Br

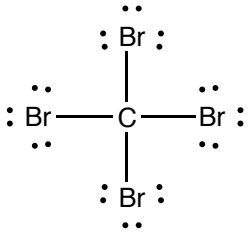
34. (a) Br^- Kr (b) Cs+ Xe (c) P^{3-} Ar (d) S^{2-} Ar

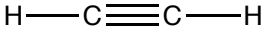
39. (a) Ba^{2+} [Xe] S^{2-} [Ar] (b) Sr^{2+} [Kr] F [Ne] (c) Mg^{2+} [Ne] O^{2-} [Ne]
(d) Al^{3+} [Ne] S^{2-} [Ar]

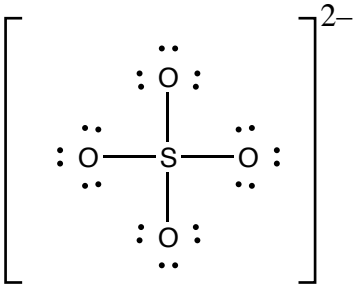
46. (a) Mg > Mg^{2+} (b) $K^+ > Ca^{2+}$ (c) $Br^- > Rb^+$ (d) $Se^{2-} > Se$

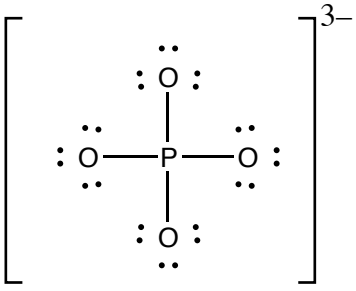
59. a. 

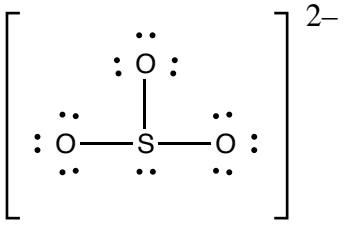
b. 

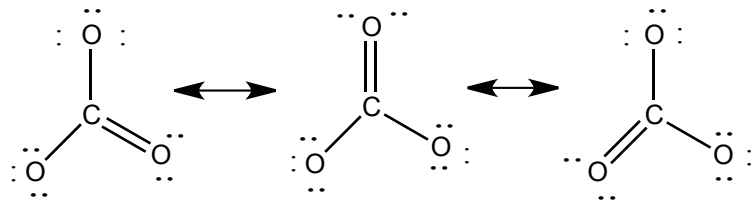
c. 

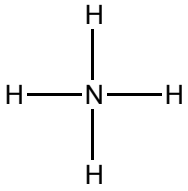
d. 

65. . 

b. 

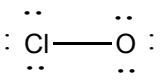
c. 

68. (a) 



(b)

(c)



78. In NF_3, the central nitrogen atom has four pairs of electron pairs, but the boron atom in BF_3 has only three pairs. The nonbonding electron pair on the N atom in NF_3 pushes the fluorine atoms out of the plane of the nitrogen atom.

82. (a) tetrahedral (b) pyramidal (c) bent or V-shaped