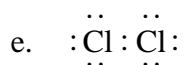
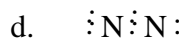
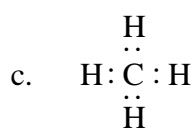
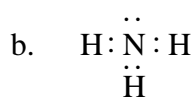
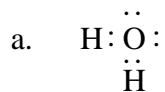


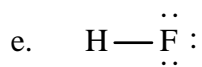
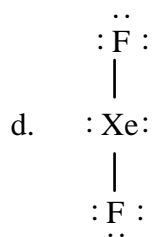
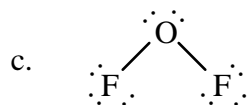
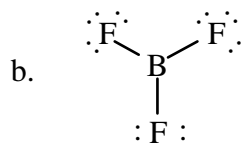
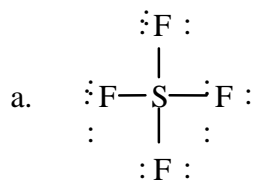
PRACTICE PROBLEMS FOR CHAPTER 9 (ANSWERS IN THE END)

- 9.2 How many electrons does a stable strontium **ION** have?
 a. 2 b. 28 c. 36 d. 38 e. 40
- 9.8 What is the electron configuration of Ni^{2+} ?
 a. $[\text{Ar}] 3d^6 4s^2$ b. $[\text{Ar}] 3d^7 4s^1$ c. $[\text{Ar}] 3d^8$ d. $[\text{Ar}] 3d^8 4s^2$ e. $[\text{Ar}] 3d^8 4s^1$
- 9.19 Which of the following species would you expect to have the largest radius?
 a. K^+ b. Cl^- c. Br^- d. Kr e. Al^{3+}
- 9.24 All the following species are isoelectronic **EXCEPT**
 a. Ca^{2+} . b. Mg^{2+} . c. Cl^- . d. Ar . e. S^{2-} .
- 9.27 What is the electronic configuration of a stable sulfide ion?
 a. $1s^2 2s^2 2p^6$ b. $1s^2 2s^2 2p^6 3s^2$ c. $1s^2 2s^2 2p^6 3s^2 3p^4$
 d. $1s^2 2s^2 2p^6 3s^2 3p^3$ e. $1s^2 2s^2 2p^6 3s^2 3p^6$
- 9.36 How many electrons are shown in the Lewis formula for the chlorate ion, ClO_3^- ?
 a. 24 b. 26 c. 28 d. 30 e. 32
- 9.41 The total number of valence electrons in the dihydrogen phosphate ion, H_2PO_4^- , is
 a. 28. b. 30. c. 32. d. 34. e. 36.
- 9.46 Which compound contains both ionic and covalent bonds?
 a. KCl b. H_2O c. CH_2Cl_2 d. MgCl_2 e. CH_4
- 9.49 The larger the difference in electronegativity,
 1. the more ionic the bond.
 2. the more covalent the bond.
 3. the more polar the bond.
 a. 1 only b. 2 only c. 3 only d. 1 and 3 only e. 2 and 3 only
- 9.52 Which atom would be expected to be the most electronegative?
 a. B b. Na c. N d. Cs e. Al
- 9.54 In which of the following species is there the greatest unequal sharing of the bonding electrons?
 a. SO_3 b. SO_3^{2-} c. NH_4^+ d. H_2O e. H_2S
- 9.58 Which of the following is an exception to the octet rule?
 a. CH_3OH b. CCl_4 c. PH_3 d. BF_3 e. BF_4^-
- 9.61 In which of the compounds is the octet rule violated by the central atom?
 a. PF_3 b. SiF_4 c. OF_2 d. ClF_3 e. ClF
- 9.64 The Lewis structure for phosphine, PH_3 , has
 a. four bonding pairs.
 b. two bonding pairs and two lone pairs.
 c. three bonding pairs and one lone pair.
 d. one bonding pair and three lone pairs.
 e. four lone pairs.
- 9.67 In the Lewis structure for the NF_2^- ion, the number of lone pairs of electrons around the nitrogen atom is
 a. 0. b. 1. c. 2. d. 3. e. 4.
- 9.69 Which species has the largest number of lone pairs of electrons around the central atom?
 a. XeOF_4 b. XeF_6 c. XeF_4 d. XeF_2 e. SiF_6^{2-}
- 9.79 Which compound contains both ionic and covalent bonds?
 a. PF_3 b. KF c. NaH d. MgSO_3 e. C_3H_8

9.84 Which of the following covalent compounds does **NOT** have the proper electron-dot formula?



9.85 Which of the following species does **NOT** have the proper electron-dot formula?



9.88 Which one of the following has a Lewis structure **MOST** like that of NO^- ?

- a. O_2^-
- b. O_2^{2-}
- c. O_2
- d. NO
- e. NO^+

9.91 Which of the following compounds has the most ionic bonding (has the highest percentage of ionic character)?

- a. LiI
- b. CaF_2
- c. CsF
- d. LiF
- e. OF_2

- 9.93 Which of the following compounds would be expected to have the highest melting point? (Hint – it will also have the largest Lattice Energy!!)
- LiF
 - LiCl
 - CsF
 - NaBr
 - CsI

Questions 9.106 to 9.108 refer to the material given below. The answer to each question is one of these five lettered equations. Select the one letter whose equation is most clearly related to the question. A letter can be used more than once.

- $\text{Br}_2(l) \longrightarrow \text{Br}_2(g)$
- $\text{Br}_2(g) \longrightarrow 2\text{Br}(g)$
- $\text{Br}(g) + e \longrightarrow \text{Br}^-(g)$
- $\text{KBr}(s) \longrightarrow \text{K}^+(g) + \text{Br}^-(g)$
- $\text{K}(s) + \frac{1}{2}\text{Br}_2(l) \longrightarrow \text{KBr}(s)$

9.106 Which process represents the crystal lattice energy?

9.108 The process corresponding to the electron affinity is

9.115 Which of the following species has the shortest bond distance?

- CO
- NO^-
- O_2
- F_2
- Cl_2

9.124 From a consideration of the Lewis structure of the thiocyanate ion, SCN^- , in which carbon has a double bond with both the sulfur and nitrogen atoms, the formal charges on the sulfur, carbon, and nitrogen atoms are, respectively,

- 1, 0, 0.
- 0, 0, -1.
- 1, +1, -1.
- 2, +1, 0.
- 2, 0, +1.

9.127 What is the formal charge on the chlorine atom in the chlorate ion, ClO_3^- , which is drawn showing three single bonds?

- a. +2 b. +1 c. 0 d. -1 e. -2

9.129 Which of the following species has a Lewis structure similar to H_3O^+ ?

- NH_3
- HCO_3^-
- CO_3^{2-}
- ClF_3
- NF_3

- 9.131 The most important factor in the formation of ionic compounds from their elements is
- ion pairing.
 - electron affinity.
 - lattice energy.
 - ionization energy.
 - reorganization energy.
- 9.132 During the formation of a chemical bond between two hydrogen atoms, which of the following statements is always true?
- Electrons always are between the nuclei of the atoms.
 - A polar covalent bond is formed.
 - Energy is always required to form the bond.
 - Energy is released during the formation of the bond.

ANSWERS:

- 9.2 *c.36
 9.19*c.Br⁻
 9.27*e. 1s² 2s² 2p⁶ 3s² 3p⁶
 9.41*c.32.
 9.49 *d. 1 and 3 only
 9.54 *d. H₂O
 9.61 *d. ClF₃
 9.67 *c. 2.
 9.79 *d. MgSO₃
 9.84
 *d. $\begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{:N:N:} \\ \cdot\cdot \\ \cdot\cdot \end{array}$
 9.85
 *a. $\begin{array}{c} \cdot\cdot \\ \text{:F:} \\ | \\ \cdot\cdot \quad \cdot\cdot \\ \text{:F-S-F:} \\ | \\ \cdot\cdot \\ \text{:F:} \\ \cdot\cdot \end{array}$
 9.88 *c. O₂
 9.91*c.CsF
 9.93 *a. LiF
 9.106 *d.
 9.108 *c.
 9.115 *a. CO
 9.124 *b. 0, 0, -1.
 9.127 *a. +2
 9.129 *a. NH₃
 9.131 *c. lattice energy.
 9.132*d.Energy is released during the formation of the bond.