

Homework – Chapter 05 Chemistry 51

Los Angeles Mission College

- 5.91 Write the electron configuration for each of the following:
- N^{3-}
 - Mg^{2+}
 - P^{3-}
 - Al^{3+}
 - Li^+
- 5.92 Write the electron configuration for each of the following:
- K^+
 - Na^+
 - S^{2-}
 - Cl^-
 - Ca^{2+}
- 5.93 One of the ions of tin is tin (IV).
- What is the symbol for this ion?
 - How many protons and electrons are in the ion?
 - What is the formula of tin (IV) oxide?
 - What is the formula of tin (IV) phosphate?
- 5.94 One of the ions of gold is gold (III).
- What is the symbol for this ion?
 - How many protons and electrons are in the ion?
 - What is the formula of gold (III) sulfate?
 - What is the formula of gold (III) nitrate?
- 5.95 Write the symbol for the ion of each of the following:
- chloride
 - potassium
 - oxide
 - aluminum
- 5.96 Write the symbol for the ion of each of the following:
- fluoride
 - calcium
 - sodium
 - phosphide
- 5.97 What is the name of each of the following ions?
- K^+
 - S^{2-}
 - Ca^{2+}
 - N^{3-}
- 5.98 What is the name of each of the following ions?
- Mg^{2+}
 - Ba^{2+}
 - I^-
 - Cl^-
- 5.99 Write the formula for each of the following ionic compounds:
- tin(II) sulfide
 - lead(IV) oxide
 - silver chloride
 - calcium nitride
 - copper(I) phosphide
 - chromium(II) bromide
- 5.100 Write the formula for each of the following ionic compounds:
- nickel(III) oxide
 - iron(III) sulfide
 - lead(II) sulfide
 - chromium(III) iodide
 - lithium nitride
 - gold(I) oxide

Homework – Chapter 05 Chemistry 51

Los Angeles Mission College

- 5.101 Draw the electron-dot formula for each of the following:
- Cl_2O
 - CF_4
 - H_2NOH (N is the central atom)
 - H_2CCCl_2
- 5.102 Draw the electron-dot formula for each of the following:
- H_3COCH_3 ; the atoms are in the order C O C
 - CS_2 ; the atoms are in the order S C S
 - NH_3
 - H_2CCHCN ; the atoms are in the order C C C N
- 5.103 Name each of the following covalent compounds:
- NCl_3
 - N_2S_3
 - N_2O
 - F_2
 - SO_2
 - P_2O_5
- 5.104 Name each of the following covalent compounds:
- CBr_4
 - SF_6
 - Br_2
 - N_2O_4
 - PCl_5
 - CS_2
- 5.105 Write the formula for each of the following:
- carbon monoxide
 - diphosphorus pentoxide
 - dihydrogen sulfide
 - sulfur dichloride
- 5.106 Write the formula for each of the following:
- silicon dioxide
 - carbon tetrabromide
 - diphosphorus tetraiodide
 - dinitrogen oxide
- 5.107 Classify each of the following compounds as ionic or covalent, and give its name:
- FeCl_3
 - Na_2SO_4
 - NO_2
 - N_2
 - PF_5
 - CF_4
- 5.108 Classify each of the following compounds as ionic or covalent, and give its name:
- $\text{Al}_2(\text{CO}_3)_3$
 - ClF_5
 - H_2
 - Mg_3N_2
 - ClO_2
 - CrPO_4
- 5.109 Write the formulas for the following:
- tin(II) carbonate
 - lithium phosphide
 - silicon tetrachloride
 - manganese(III) oxide
 - iodine
 - calcium bromide

Homework – Chapter 05 Chemistry 51

Los Angeles Mission College

- 5.110 Write the formulas for the following:
- sodium carbonate
 - nitrogen dioxide
 - aluminum nitrate
 - copper(I) nitride
 - potassium phosphate
 - cobalt(III) sulfate
- 5.111 Select the more polar bond in each of the following pairs:
- C—N or C—O
 - N—F or N—Br
 - Br—Cl or S—Cl
 - Br—Cl or Br—I
 - N—F or N—O
- 5.112 Select the more polar bond in each of the following pairs:
- C—C or C—O
 - P—Cl or P—Br
 - Si—S or Si—Cl
 - F—Cl or F—Br
 - P—O or P—S
- 5.113 Show the dipole arrow for each of the following bonds:
- Si—Cl
 - C—N
 - F—Cl
 - C—F
 - N—O
- 5.114 Show the dipole arrow for each of the following bonds:
- C—O
 - N—F
 - O—Cl
 - S—Cl
 - P—F
- 5.115 Classify each of the following bonds as nonpolar covalent, polar covalent, or ionic:
- Si—Cl
 - C—C
 - Na—Cl
 - C—H
 - F—F
- 5.116 Classify each of the following bonds as nonpolar covalent, polar covalent, or ionic:
- C—N
 - Cl—Cl
 - K—Br
 - H—H
 - N—F
- 5.117 For each of the following, draw the electron-dot formula and determine the shape of the molecule:
- NF₃
 - SiBr₄
 - BeCl₂
 - SO₂
- 5.118 For each of the following, draw the electron-dot formula and determine the shape of the molecule:
- SiH₄
 - HCCH
 - COCl₂ (C is the central atom)
 - BCl₃

Homework – Chapter 05 Chemistry 51
Los Angeles Mission College

Answers...

5.91 Write the electron configuration for each of the following:

- a. N^{3-} $1s^2 2s^2 2p^6$
- b. Mg^{2+} $1s^2 2s^2 2p^6$
- c. P^{3-} $1s^2 2s^2 2p^6 3s^2 3p^6$
- d. Al^{3+} $1s^2 2s^2 2p^6$
- e. Li^+ $1s^2$

5.92 Write the electron configuration for each of the following:

- a. K^+ $1s^2 2s^2 2p^6 3s^2 3p^6$
- b. Na^+ $1s^2 2s^2 2p^6$
- c. S^{2-} $1s^2 2s^2 2p^6 3s^2 3p^6$
- d. Cl^- $1s^2 2s^2 2p^6 3s^2 3p^5$
- e. Ca^{2+} $1s^2 2s^2 2p^6 3s^2 3p^6$

5.93 One of the ions of tin is tin (IV).

- a. What is the symbol for this ion? Sn^{4+}
- b. How many protons and electrons are in the ion? 50 Protons, 46 Electrons
- c. What is the formula of tin (IV) oxide? SnO_2
- d. What is the formula of tin (IV) phosphate? $Sn_3(PO_4)_4$

5.94 One of the ions of gold is gold (III).

- a. What is the symbol for this ion? Au^{3+}
- b. How many protons and electrons are in the ion? 79 Protons, 76 Electrons
- c. What is the formula of gold (III) sulfate? $Au_2(SO_4)_3$
- d. What is the formula of gold (III) nitrate? $Au(NO_3)_3$

5.95 Write the symbol for the ion of each of the following:

- a. Chloride Cl^-
- b. Potassium K^+
- c. Oxide O^{2-}
- d. Aluminum Al^{3+}

5.96 Write the symbol for the ion of each of the following:

- a. Fluoride F^-
- b. Calcium Ca^{2+}
- c. Sodium Na^+
- d. Phosphide P^{3-}

Noble Gases	Metals Lose Valence Electrons			Nonmetals Gain Valence Electrons			Noble Gases
	1A (1)	2A (2)	3A (13)	5A (15)	6A (16)	7A (17)	
He	← Li^+						
Ne	← Na^+	Mg^{2+}	Al^{3+}	N^{3-}	O^{2-}	F^-	→ Ne
Ar	← K^+	Ca^{2+}		P^{3-}	S^{2-}	Cl^-	→ Ar
Kr	← Rb^+	Sr^{2+}				Br^-	→ Kr
Xe	← Cs^+	Ba^{2+}				I^-	→ Xe

5.97 What is the name of each of the following ions?

- a. K^+ Potassium
- b. S^{2-} Sulfide
- c. Ca^{2+} Calcium
- d. N^{3-} Nitride

5.98 What is the name of each of the following ions?

- a. Mg^{2+} Magnesium
- b. Ba^{2+} Barium
- c. I^- Iodide
- d. Cl^- Chloride

5.99 Write the formula for each of the following ionic compounds:

- a. tin(II) sulfide SnS
- b. lead(IV) oxide PbO_2
- c. silver chloride $AgCl$
- d. calcium nitride Ca_3N_2
- e. copper(I) phosphide Cu_3P
- f. chromium(II) bromide $CrBr_2$

5.100 Write the formula for each of the following ionic compounds:

- a. nickel(III) oxide Ni_2O_3
- b. iron(III) sulfide Fe_2S_3
- c. lead(II) sulfide PbS
- d. chromium(III) iodide CrI_3
- e. lithium nitride Li_3N
- f. gold(I) oxide Au_2O

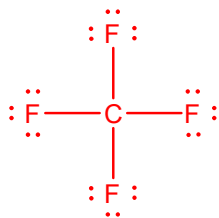
Homework – Chapter 05 Chemistry 51

Los Angeles Mission College

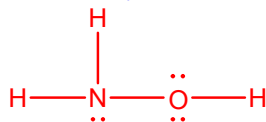
5.101 Draw the electron-dot formula for each of the following:

a. Cl_2O

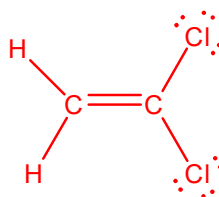
b. CF_4



c. H_2NOH (N is the central atom)

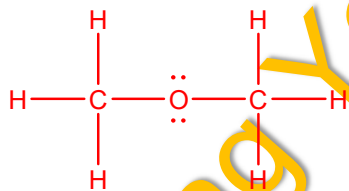


d. H_2CCCl_2



5.102 Draw the electron-dot formula for each of the following:

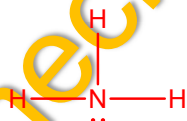
a. H_3COCH_3 ; the atoms are in the order C O C



b. CS_2 ; the atoms are in the order S C S



c. NH_3



d. H_2CCHCN ; the atoms are in the order C C C N

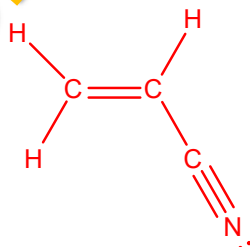


TABLE 5.12 Prefixes Used in Naming Covalent Compounds

1	mono	6	hexa
2	di	7	hepta
3	tri	8	octa
4	tetra	9	nona
5	penta	10	deca

5.103 Name each of the following covalent compounds:

- a. NCl_3 Nitrogen Trichloride
- b. N_2S_3 Dinitrogen Sulfide
- c. N_2O Dinitrogen Oxide
- d. F_2 Fluorine
- e. SO_2 Sulfur Dioxide
- f. P_2O_5 Diphosphorus Pentoxide

Homework – Chapter 05 Chemistry 51

Los Angeles Mission College

5.104 Name each of the following covalent compounds:

- a. CBr_4 Carbon Tetrabromide
- b. SF_6 Sulfur Hexafluoride
- c. Br_2 Bromine
- d. N_2O_4 Dinitrogen Tetroxide
- e. PCl_5 Monophosphorus Pentachloride
- f. CS_2 Carbon Disulfide

5.105 Write the formula for each of the following:

- a. carbon monoxide CO
- b. diphosphorus pentoxide P_2O_5
- c. dihydrogen sulfide H_2S
- d. sulfur dichloride SCl_2

5.106 Write the formula for each of the following:

- a. silicon dioxide SiO_2
- b. carbon tetrabromide CBr_4
- c. diphosphorus tetraiodide P_2I_4
- d. dinitrogen oxide N_2O

5.107 Classify each of the following compounds as ionic or covalent, and give its name:

- a. FeCl_3 Iron (III) Chloride Δ electronegativity = 1.33 Covalent
- b. Na_2SO_4 Sodium Sulfate Δ electronegativity = 2.51 Ionic
- c. NO_2 Nitrogen Dioxide Δ electronegativity = 0.40 Covalent
- d. N_2 Nitrogen Δ electronegativity = 0 Covalent
- e. PF_5 Phosphorous Pentafluoride Δ electronegativity = 1.79 Ionic
- f. CF_4 Carbon Tetrafluoride Δ electronegativity = 1.43 Covalent

5.108 Classify each of the following compounds as ionic or covalent, and give its name:

- a. $\text{Al}_2(\text{CO}_3)_3$ Aluminum Carbonate Δ electronegativity = 1.83 Ionic
- b. ClF_5 Chlorine Pentafluoride Δ electronegativity = 0.82 Covalent
- c. H_2 Hydrogen Δ electronegativity = 0 Covalent
- d. Mg_3N_2 Magnesium Nitride Δ electronegativity = 1.73 Ionic
- e. ClO_2 Chlorine Dioxide Δ electronegativity = 0.28 Covalent
- f. CrPO_4 Chromium (III) Phosphate Δ electronegativity = 1.78 Ionic

5.109 Write the formulas for the following:

- a. tin(II) carbonate SnCO_3
- b. lithium phosphide Li_3P
- c. silicon tetrachloride SiCl_4
- d. manganese(III) oxide Mn_2O_3
- e. iodine I_2
- f. calcium bromide CaBr_2

5.110 Write the formulas for the following:

- a. sodium carbonate Na_2CO_3
- b. nitrogen dioxide NO_2
- c. aluminum nitrate $\text{Al}(\text{NO}_3)_3$
- d. copper(I) nitride Cu_3N
- e. potassium phosphate K_3PO_4
- f. cobalt(III) sulfate $\text{Co}_2(\text{SO}_4)_3$

5.111 Select the more polar bond in each of the following pairs:

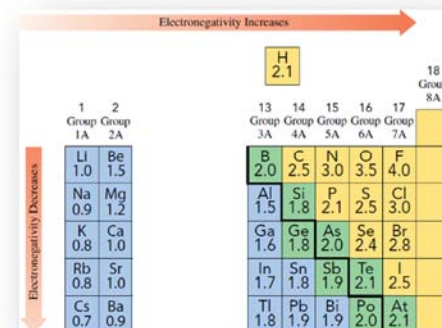
- a. C—N or C—O C—O
- b. N—F or N—Br N—F
- c. Br—Cl or S—Cl S—Cl
- d. Br—Cl or Br—I Br—I
- e. N—F or N—O N—F

5.112 Select the more polar bond in each of the following pairs:

- a. C—C or C—O C—O
- b. P—Cl or P—Br P—Cl
- c. Si—S or Si—Cl Si—Cl
- d. F—Cl or F—Br F—Br
- e. P—O or P—S P—O

1	mono	6	hexa
2	di	7	hepta
3	tri	8	octa
4	tetra	9	nona
5	penta	10	deca

Nonmetal	Formula of Ion ^a	Name of Ion
Hydrogen	OH^-	Hydroxide
Nitrogen	NH_4^+	Ammonium
	NO_3^-	Nitrate
	NO_2^-	Nitrite
Chlorine	ClO_4^-	Perchlorate
	ClO_3^-	Chlorate
	ClO_2^-	Chlorite
	ClO^-	Hypochlorite
Carbon	CO_3^{2-}	Carbonate
	HCO_3^-	Hydrogen carbonate (or bicarbonate)
	CN^-	Cyanide
	$\text{H}_2\text{C}_3\text{O}_2^-$	Acetate
Sulfur	SO_4^{2-}	Sulfate
	HSO_4^-	Hydrogen sulfate (or bisulfate)
	SO_3^{2-}	Sulfite
	HSO_3^-	Hydrogen sulfite (or bisulfite)
Phosphorus	PO_4^{3-}	Phosphate
	HPO_4^{2-}	Hydrogen phosphate
	H_2PO_4^-	Dihydrogen phosphate
	PO_3^{3-}	Phosphite

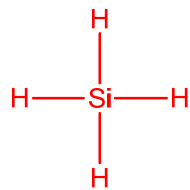


Homework – Chapter 05 Chemistry 51

Los Angeles Mission College

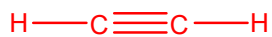
5.118 For each of the following, draw the electron-dot formula and determine the shape of the molecule:

a. SiH_4



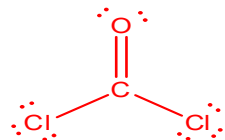
Tetrahedral

b. HCCH



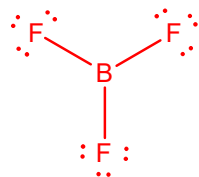
Linear

c. COCl_2 (C is the central atom)



Trigonal Planar

d. BCl_3



Trigonal Planar

For Checking Your Work Only