Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_

**Unit 3 Homework Packet**

**Ionic Bonding WS #1**

*For each of the following elements, state*

1. Will these atoms bond together? (if no, skip b-d)
2. What type of bond will they form? (if covalent, skip c, d)
3. Draw the Lewis Dot diagram for the formation of the ionic bond. Use the proper format that we practiced in class.
4. Write the chemical formula for the compound.
5. Lithium and silver
6. Argon and nitrogen
7. Sodium and iodine
8. Lithium and phosphorus
9. Aluminum and oxygen
10. sodium and selenium
11. magnesium and fluorine
12. Be and O
13. potassium and chlorine
14. Ca and As
15. Mg and Br
16. Li and I
17. Ra and N
18. *Read page 194 in your text book.* What is a polyatomic ion?

## Ionic Bonding WS #2

## Isoelectronic Species

*With which noble gas is each element isoelectronic?*

1. F- \_\_\_\_\_
2. S-2 \_\_\_\_\_
3. P-3 \_\_\_\_\_
4. B+3 \_\_\_\_\_
5. Br- \_\_\_\_\_
6. Ca+2 \_\_\_\_\_
7. Na+ \_\_\_\_\_
8. Rb+ \_\_\_\_\_
9. Ba+2 \_\_\_\_\_
10. Ra+2 \_\_\_\_\_
11. Choose the species with the different electron configuration.
    1. Ni+ b. Cu+2 c. Co d. Ag+2
12. Choose the species with the different electron configuration.
    1. Ba+2 b. Cs+  c. Rn d. Te-2
13. Write the polyatomic ions for
    1. Ammonium
    2. Nitrate
    3. Phosphate
    4. Sulfate
    5. Carbonate
    6. Hydroxide
14. Write the chemical formula for the bond between
    1. Sodium and phosphate c. Calcium and nitrate
    2. Ammonium and carbonate d. Aluminum and hydroxide
15. Draw the Lewis Dot Diagram for the formation of calcium and phosphorus.

## Variable Charge Cations

1. Copper(II) bonds with hydroxide. Write the chemical formula.
2. Iron (III) bonds with sulfate. Write the chemical formula.
3. The net charge on an ionic compound has to add up to what?

# Covalent Bonding WS #1

*Practice drawing the Lewis Structures for the following covalent molecule.*

1. FCl
2. P2
3. CCl4
4. NBr3
5. SCl2
6. O2
7. SiO2
8. BrI
9. I2
10. Se2
11. SO2
12. CF4

Covalent Bonding WS #1.5

*Five Hints*

Draw the Lewis Dot Diagram for the following:

1. C2H5OC2H4COOCH2COC3H6OH
2. CH3COOC4H8OCH2COOH
3. C3H7COOC2H4COOCOCH2OCH3
4. HOCH2OCH2COOCOOH
5. HOOCC2H4OCH2COOCOOH

Covalent Bonding WS #2

Tools:

1. Find the total number of valence electrons that you can use.
2. Find the total number of bonds that are made.

Tips:

1. Recognize the five hints, O, CO, OH, COO, COOH.
2. Start by connecting the carbons with single bonds to form a chain.
3. Leave the hydrogens for last.
4. Practice.

Practice Problems:

1. C5H11OCOCH2OH
2. HOOCCOOH
3. CO2
4. SiO2
5. N2
6. NP
7. H2SO4
8. C2H6
9. C2H4
10. C2H2
11. C3H8
12. C3H6
13. C3H4
14. C2HCH2OC4H6COCOOCH2OH

**Covalent Bond W.S. #3**

*Draw the Lewis Diagram for the following molecules.*

1. HOCHCHCH2COOC2H4COOH
2. H2SO4
3. C4H7OCOCOOCOOH
4. C2H5OC2H2COC3H7
5. CH3C2OCH2C3H4OH
6. CI4
7. NH3

*Draw the Lewis Diagrams for the following polyatomic ions.*

1. phosphate
2. nitrate
3. hydroxide
4. nitrite
5. carbonate
6. sulfate

*Draw the Lewis Diagrams for these molecules or compounds.*

1. sodium carbonate
2. CO
3. CO2
4. S2
5. MgS
6. iron (II) fluoride
7. cobalt (I) oxide

**Metallic Bonding**

*Read section 6.4*

1. Compare the malleability and ductility of metals and ionic crystals.
2. How does our model of bonding explain these differences in properties?

**Molecular Geometry**

*For each substance,*

*a) Draw the Lewis Structure*

*b) Draw the 3-D shape*

*c) Name the shape*

1. BCl3
2. CO2
3. NFO (Fluorine is in the middle)
4. NI3
5. SCl2