

Name \_\_\_\_\_

Period: \_\_\_\_\_

### Ion formation

1) Write the electron configuration and circle the valence electrons for each element.

a) Al

e) Cu

b) O

f) Ca

c) N

g) Cl

d) Na

h) S

2) For each element in problem 1, state the number of electrons that each element will lose or gain to become stable. Write the symbol for the cation or anion that forms, including its charge. (Ex: Mg lose  $2e^-$ ,  $Mg^{2+}$ )

a)

E)

b)

f)

c)

g)

c)

h)

3) Write the chemical formula of the compounds that will form from the following ions.

a)  $Mg^{2+}O^{2-}$  \_\_\_\_\_

b)  $Fe^{3+}F^{1-}$  \_\_\_\_\_

c)  $K^{1+}Br^{1-}$  \_\_\_\_\_

d)  $Cs^{1+}O^{2-}$  \_\_\_\_\_

e)  $Li^{1+}S^{2-}$  \_\_\_\_\_

f)  $Fe^{3+}O^{2-}$  \_\_\_\_\_

Answer the following questions using complete sentences where appropriate.

4) Explain why atoms of noble gases do not easily form bonds unlike most other atoms?

5) What happens to energy and stability of an atom when it forms a chemical bond?

## Introduction to Bonding

Fill in the chart with the correct information

	Magnesium	Oxygen
1. Electron configuration		
2. # valence electrons		
3. Gain or lose e- to form ion		
4. How many e- gained or lost?		

5. Explain how you think magnesium and oxygen could react with each other to form magnesium oxide?

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6. Complete the table to predict how the following elements will achieve noble gas configurations.

Element	Noble Gas Configuration	# valence electrons	# electrons gained or lost	Formula of ion
Sodium				
Fluorine				
Calcium				
Potassium				
Oxygen				
Nitrogen				
Lithium				
Aluminum				
Bromine				
Magnesium				

7. Pick an element from #6 above that would form a positive ion. Explain why and how it forms a positive ion.

8. In the space provided below, draw a model to represent calcium and bromine with their valence electrons. Show how calcium forms a 2+ ion and bromine forms a 1- ion. Tell where bromine gets its electrons to form negative ions. Describe how many bromine atoms would have to be available to form ions with one calcium atom.

## Ion Naming Practice

Name \_\_\_\_\_

Write the charge of the ion in the box with the element name. Then write the balanced formula and name in each box

	Potassium ion	Calcium ion	Aluminum ion
Bromide			
Oxide			
Nitride			

### Name binary ionics

1. NaCl \_\_\_\_\_
2. CaCl<sub>2</sub> \_\_\_\_\_
3. MgBr<sub>2</sub> \_\_\_\_\_
4. K<sub>2</sub>S \_\_\_\_\_
5. Ba<sub>3</sub>N<sub>2</sub> \_\_\_\_\_

### Write formula for binary ionics:

1. magnesium oxide \_\_\_\_\_
2. potassium chloride \_\_\_\_\_
3. strontium phosphide \_\_\_\_\_
4. lithium fluoride \_\_\_\_\_
5. aluminum sulfide \_\_\_\_\_

## Practice: Basic ionic names and formulas – Additional practice

Write the charge of the ion in the box with the element name. Then write the balanced formula and name in each box

	Sodium ion	Magnesium ion	Aluminum ion
Iodide			
Sulfide			
Phosphide			

1. rubidium selenide \_\_\_\_\_
2. sodium selenide \_\_\_\_\_
3. barium iodide \_\_\_\_\_
4. beryllium bromide \_\_\_\_\_

## Practice Ionic names and formulas with Transition metals.

Write the charge of the ion in the box with the element name. Then write the balanced formula and name in each box

	Iron (II) ion	Iron (III) ion
Chloride		
Sulfide		
Nitride		

### Name binary ionic compounds including transition metals

1. AgCl \_\_\_\_\_

2. FeN \_\_\_\_\_

3. Fe<sub>3</sub>N<sub>2</sub> \_\_\_\_\_

4. CuO \_\_\_\_\_

5. Cu<sub>2</sub>O \_\_\_\_\_

### Write formula for binary ionic compounds including transition metals

1. mercury(II) sulfide \_\_\_\_\_

2. lead(IV) bromide \_\_\_\_\_

3. copper(I) phosphide \_\_\_\_\_

4. zinc iodide \_\_\_\_\_

5. copper(II) fluoride \_\_\_\_\_

6. iron(III) oxide \_\_\_\_\_

Write the charge of the ion in the box with the element name. Then write the balanced formula and name in each box

	Copper (I) ion	Tin (II) ion
Fluoride		
Oxide		
Phosphide		

1. mercury(I) nitride \_\_\_\_\_

2. zinc selenide \_\_\_\_\_

3. iron(II) oxide \_\_\_\_\_

4. tin(II) oxide \_\_\_\_\_

## Polyatomic Ions

Write the charge of the ion in the box with the element name. Then write the balanced formula and name in each box

	<b>Lithium ion</b>	<b>Copper (II) ion</b>	<b>Ammonium ion</b>
<b>Nitrate</b>			
<b>Sulfite</b>			
<b>Phosphate</b>			

Name each of the following ionic compounds that contain polyatomic ions.

1.  $\text{NH}_4\text{Cl}$  \_\_\_\_\_

2.  $\text{KOH}$  \_\_\_\_\_

3.  $\text{Na}_2\text{SO}_4$  \_\_\_\_\_

4.  $\text{Mg}(\text{NO}_3)_2$  \_\_\_\_\_

5.  $\text{AgC}_2\text{H}_3\text{O}_2$  \_\_\_\_\_

**Write the correct formula for each of the following ionic compounds that contain polyatomic ions.**

1. lithium sulfide \_\_\_\_\_

2. calcium sulfate \_\_\_\_\_

3. sodium sulfite \_\_\_\_\_

4. ammonium hydroxide \_\_\_\_\_

5. copper(II) sulfate \_\_\_\_\_

Write the charge of the ion in the box with the element name. Then write the balanced formula and name in each box

	<b>Sodium ion</b>	<b>Chromium (III) ion</b>	<b>Zinc ion</b>
<b>Acetate</b>			
<b>Carbonate</b>			
<b>Phosphate</b>			

**Name each of the following ionic compounds that contain polyatomic ions.**

1.  $\text{Cs}_2\text{SO}_3$  \_\_\_\_\_

4.  $\text{LiNO}_2$  \_\_\_\_\_

2.  $\text{AlPO}_4$  \_\_\_\_\_

5.  $\text{KHCO}_3$  \_\_\_\_\_

3.  $\text{BaCO}_3$  \_\_\_\_\_

**Write the correct formula for each of the following ionic compounds that contain polyatomic ions.**

1. rubidium phosphate \_\_\_\_\_

2. aluminum hydroxide \_\_\_\_\_

3. strontium acetate \_\_\_\_\_

4. beryllium nitrate \_\_\_\_\_

5. potassium nitrite \_\_\_\_\_

## Ion Naming Review

Sodium Nitrate	$K_2SO_4$
Calcium Fluoride	$Na_3PO_4$
Magnesium Sulfate	$Pb(NO_3)_2$
Sodium Carbonate	$FeCl_3$
Potassium Bromide	$BaCl_2$
Iron (II) Sulfate	$Ca(OH)_2$
Magnesium Chloride	$Al_2(SO_4)_3$
Copper (II) Carbonate	$K_2O$
Potassium Nitrite	$FeO$
Sodium Acetate	$CaI_2$
Iron (II) Hydroxide	$NH_4Br$
Aluminum Sulfite	$BaCl_2$
Magnesium Oxide	$FePO_4$
Lead (II) Iodide	$Ag_2SO_4$
Mercury (I) Chloride	$Co(OH)_2$
Aluminum Oxide	$Cu_2O$
Lithium Nitrate	$CrPO_4$
Zinc Acetate	$Al(OH)_3$
Sodium Selenide	$Na_3P$
Sodium Chloride	$CaBr_2$

## Practice Ionic Nomenclature

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

### A. Binary Compounds – Write the formula for the following Compounds

1. Aluminum oxide \_\_\_\_\_
2. Calcium bromide \_\_\_\_\_
3. Beryllium sulfide \_\_\_\_\_

### B. Binary Compounds - Write the name of the following compounds.

1. NaCl \_\_\_\_\_
2.  $\text{Ca}_3\text{P}_2$  \_\_\_\_\_
3.  $\text{K}_2\text{O}$  \_\_\_\_\_

### C. Ionic Bonds with Transition Metals – Write the formula for the following compounds.

1. Tungsten (VI) oxide \_\_\_\_\_
2. Titanium (IV) chloride \_\_\_\_\_
3. Chromium (II) nitride \_\_\_\_\_

### D. Ionic Bonds with Transition Metals - Write the name of the following compounds.

1.  $\text{Fe}_2\text{O}_3$  \_\_\_\_\_
2.  $\text{Cu}_3\text{N}$  \_\_\_\_\_
3.  $\text{CuO}$  \_\_\_\_\_

### E. Ionic Bonds with Polyatomic Ions - Write the formula for the following compounds.

1. Sodium and Hydroxide \_\_\_\_\_
2. Magnesium and Phosphate \_\_\_\_\_
3. Ammonium and Sulfate \_\_\_\_\_

### F. Ionic Bonds with Polyatomic Ions - Write the name of the following compounds.

1.  $\text{Al}_2(\text{SO}_4)_3$  \_\_\_\_\_
2.  $\text{NaNO}_3$  \_\_\_\_\_
3.  $(\text{NH}_4)_3\text{PO}_4$  \_\_\_\_\_

### G. General Mix – Write the name **or** formula for each of the following compounds.

1. Calcium chlorate \_\_\_\_\_
2. Copper (I) iodate \_\_\_\_\_
3.  $\text{NaHCO}_3$  \_\_\_\_\_
4.  $\text{Cu}_2\text{O}$  \_\_\_\_\_
5. Silver sulfate \_\_\_\_\_
6. Aluminum phosphate \_\_\_\_\_



## Ions Pre-Test

Name \_\_\_\_\_

1. What is a chemical bond?
2. What are the two ways that a chemical bond may form?
3. What causes atoms in the same group on the periodic table to have similar properties?
4. Which electrons are involved in bonding between atoms?
5. How does the electron-dot structure in this book differ from the way we did it?
6. What is ionization energy?
7. How does the ionization energy of noble gases compare to that of group 1A elements?
8. How does reactivity of elements relate to the number of valence electrons and atom has? What family of elements is relatively unreactive and why?
9. How many valence electrons do noble gases have? What is the significance of the phrase “stable octet”?
10. What is a cation?
11. When sodium loses an electron it does not become neon even though they now have the same number of electrons. Why doesn't sodium turn into neon when it loses 1 electron?
12. What is the difference between an atom and an ion?
13. Why do atoms that lose electrons have a positive charge while atoms that gain electrons have a negative charge?
14. Why are group 1 elements more reactive than group 2?