Naming ions and chemical compounds
Worksheet #1
Mr. MacSparran

Write the symbol for each ion. Be sure to include the charge.

a. iodide ion b. barium ion c. mercury(II) ion

d. Tin(IV) ion e. Phosphide ion f. Silver ion

Name the following ions. Use your book if necessary.

a. Cu^{2+} b. O^{2-} c. Li^{+}

d. Pb^{2+} e. F^{-} f. H^{+}

Binary compounds:

Using the pairs of ions below, write the correct formulas.

a. Li^{+}, S^{2-} b. Sn^{4+}, O^{2-} c. H^{+}, Cl^{-}

d. Mg^{2+}, N^{3-} e. Sr^{2+}, Se^{2-} f. K^{+}, O^{2-}

g. Ca^{2+}, N^{3-} h. Co^{2+}, I^{-}

Write formulas for these compounds.

a. silver sulfide b. sodium nitride

c. Tin(II) chloride d. strontium iodide

Write the names for these binary ionic compounds.

a. AlI_3 b. FeO

c. Cu_2S d. CaSe

e.ZnO f. NaI

g. Cu_2O h. $CaBr_2$

Write formulas for these ternary ionic compounds.

a. Barium sulfate

b. aluminum hydrogen carbonate

c. sodium hypochlorite

d. lead(IV) chromate

e. mercury(II) bromide

f. ammonium dichromate

g. lithium hydrogen sulfate

h. chromium(III) nitrite

Write names for these compounds.

a. $Cr(NO_3)_2$

b. $Mg_3(PO_4)_2$

c. Cu_2HPO_4

d. Li_2CrO_4

e. K_3AsO_4

f. SnS_2O_3

g. LiSCN

h. CH_3NH_3F

Chapter 5 Naming and Writing formulas for Ionic Compounds

Worksheet #2

1. How do ions form?

2. Write the electron configuration for the following atoms and their ions.

Example: Sodium Atom Na $1s^2\ 2s^2\ 2p^6\ 3s^1$

Sodium Ion Na^+ $1s^2\ 2s^2\ 2p^6$

Name	Element Formula	Electron Configuration
Potassium		
Potassium Ion		
Aluminum		
Aluminum Ion		
Magnesium		
Magnesium Ion		
Fluorine		
Fluoride Ion		
Sulfur		
Sulfide Ion		
Nitrogen		
Nitride Ion		

3. Define the following

Ion-

Cation-

Anion-

Electroneutrality-

Isoelectronic-

4. Look back at question #2. All the atoms that became ions did so because they were losing or gaining enough electrons to become stable like a noble gas. The sodium ion, Na, loses one electron to become the Na^+ ion which has the same electron configuration as the noble gas neon (Ne).

Complete the following:

Atom Name	Atom Formula	#c- lost or gained	Ion Formula	Noble gas ion is like
Oxygen	O	2 gained	O^{2-}	Ne
Aluminum				
Magnesium				
Fluorine				
Sulfur				
Nitrogen				

5. Look for patterns on your periodic table to help determine an ion's charge. Notice group 1 elements always form a +1 charge. What charges do the following groups always form?
Group 2_____, Group 13_____, Group 15____, Group 16_____, Group 17_____

6. What charge do the following elements form when they become ions?
Example: Li forms Li^+
Be____, As____, K___, Rb___, Br___, F____, O____, P____, Al____, Ca____, Sr____, I____.

7. Why do ion's form?

8. The transition metals do not always form just one ion like the elements in the S an P blocks do. Copper sometimes forms the Cu^+ ion and other times it forms the Cu^{2+} ion.
What ion's do the following transition metals form?
Chromium_____ Manganese _____ Iron _____ Cobalt _____ Mercury _____.
Other elements that form more than one type of ion include tin Sn^{2+} and Sn^{4+}, Lead Pb^{2+} and Pb^{4+} these are not in your text but you'll want to know them. Also silver only forms Ag^+, <u>not</u> Ag^{2+} like your text indicates.

TIP OF THE DAY: All metals have + charges and all non-metals have – charges.

9. Naming ions from the S and P block.
If an element forms a positive ion we call this ion a CATION. To name cations all you need to do is name the element and add the word ion.
Example: sodium (Na) forms the sodium ion (Na^+).
When an element forms a negative ion we call this ion a ANION. To name anions you drop the last part of the elements name and add a 'ide' ending.
Example: nitrogen (N) forms the nitride ion (N^{3-}). The use of the word ion is optional when naming anions.

Name the following ions.

Ca^{2+} _____ O^{2-} _____ F^-_____
Ba^{2+} _____ Li^+ _____ P^{3-}_____
H^+ _____ Mg^{2+} _____ S^{2-} _____
Rb^+ _____As^{3-} _____ Br^- _____

10. Naming ions from the D block (transition metals).
Since many of the transition metals can form more than one ion we cannot just name them as cations, we have to indicate what charge they have. Here is how we do it. Copper can form the Cu+ or the Cu2+ ion. To name the Cu+ ion we write Copper (I) ion, to name the Cu2+ ion we write Copper (II) ion. Notice we wrote the charge in parenthesis and used roman numerals for the charge.

Name the following ions.

Co^{2+} _____	Sn^{2+} _____	Fe^{2+} _____
Co^{2+} _____	Sn^{4+} _____	Fe^{3+} _____
Pb^{2+} _____	Mn^{2+} _____	Cr^{2+} _____
Pb^{4+} _____	Mn^{3+} _____	Cr^{3+} _____

The three most common transition metals that only have one charge are the silver ion, Ag^{+}, Zinc ion, Zn^{2+}, and cadmium ion, Cd^{2+}. You NEVER use roman numerals with these three elements when writing their formulas or naming them.

Naming binary molecular compounds
Worksheet#3.

Binary molecular compounds are made from a combination of 2 different atoms, or in the case of diatomic molecules one kind of atom, ie. Br I N Cl H O F.

When naming a binary molecular compound you need to use prefixes

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

The prefixes indicate how many atoms of each element are in the compound.

The only time you do not use the prefix mono is when the first element in the compound has only one atom. Example: CO = carbon monoxide, not monocarbon monoxide.

When naming the second element drop the elements ending and add "IDE". Example: Oxygen = Oxide

Name the following binary molecular compounds:

1. CO_2 _____ 2. NO_3 _____

3. SO _____ 4. SO_2 _____

5. SO_4 _____ 6. SO_3 _____

7. CF_4 _____ 8. H_2O_2 _____

9. H_2O _____ 10. S_8Cl_4 _____

11. NH_3 _____ 12. N_6O_6 _____

Write the formula for the following binary molecular compounds:

1. Heptachlorine dioxide _____ 2. Trisulfur octaoxide _____

3. Pentaphosporus decaoxide _____ 4. Nitrogen hexafluoride _____

5. Disulfur dibromide _____ 6. Nitrogen monoiodide _____

7. Phosphorus trichloride _____ 8. Dinitrogen monoxide_____

9. Sulfur hexafluoride _____ 10. Dinitrogen tetrahydride _____

11. Dinitrogen pentaoxide _____ 12. Boron trichloride _____

13. Diphosphorus trioxide _____ 14. Carbon tetrabromide _____

Revised 9-8-2006 MacSparran

Naming Acids Worksheet #4

Naming Acids			
Anion Ending	Example	Acid Name	Example
-***ide***	Cl^- chlor***ide***	*Hydro*-(stem)-*ic acid*	***Hydro***chlor***ic acid***
-***ite***	SO_3^{2-} sulf***ite***	(stem)-*ous acid*	Sulfur***ous acid***
-***ate***	NO_3^- nitr***ate***	(stem)-*ic acid*	Nitr***ic acid***

Name the following acids:

HBr

$H_2C_2O_4$

HClO

HCN

H_3PO_4

HF

CH_3COOH

H_2SO_4

HNO_2

Write the formulas for the following acids.

Chromic acid

Hydroiodic acid

Chlorous acid

Perchloric acid

Carbonic acid

Phosphorous acid

Hydroselenic acid

General Chemistry Chapter 5 review worksheet # 5
Honors Chemistry Chapter 7 review worksheet # 5

If there is no polyatomic ion in the formula, just write the name of the formula.

Formula polyatomic ion formula Name of polyatomic ion Name or chemical formula

1. $Fe(ClO)_2$ _____ _____ _____

2. $LiHCO_3$ _____ _____ _____

3. $KClO_3$ _____ _____ _____

4. $(NH_4)_2S$ _____ _____ _____

5. $Zn(H_2PO_4)2$ _____ _____ _____

6. $NaClO_2$ _____ _____ _____

7. $MgSO_3$ _____ _____ _____

8. $CuNO_2$ _____ _____ _____

9. Ag_3PO_4 _____ _____ _____

10. H_2S _____ _____ _____

11. H_2SO_4 _____ _____ _____

12. $Al_2(SiO)_3$ _____ _____ _____

13. Trinitrogen Hexachloride_____ _____ _____

14. H_3PO_3 _____ _____ _____

15. Disulfur Trioxide _____ _____ _____

16. Barium chromate _____ _____ _____

17. Lithium nitrate _____ _____ _____

18. Mercury (II) sulfite _____ _____ _____

19. Colbalt (II) cyanide _____ _____ _____

20. Tin (IV) permanganate_____ _____ _____

21. Tetraoxide Octafloride _____ _____ _____

22. Permaganic acid_____ _____ _____

23. $BaCl_2$ _____ _____ _____

24. NaF _____ _____ _____

25. Al_2S_3 _____ _____ _____

26. $FeCl_2$ _____ _____ _____

27. Li_2O _____ _____ _____

28. KOH _____ _____ _____

29. SrS _____ _____ _____

30. Zn_3P_2 _____ _____ _____

31. MgS _____ _____ _____

32. MgO _____ _____ _____

33. CuO _____ _____ _____

34. AgCl _____ _____ _____

35. HCl _____ _____ _____

36.HF _____ _____ _____

37. AlN _____ _____ _____

38. Sodium nitride_____ _____ _____

39. Hydrobromic acid_____ _____ _____

40. Strontium sulfide_____ _____ _____

41. Barium phosphide _____ _____ _____

42. Lithium nitride_____ _____ _____

43. Colbalt (III) oxide_____ _____ _____

44. Copper (I) selenide_____ _____ _____

45. Tin (II) oxide_____ _____ _____

46. NO _____ _____ _____

47. NO_2 _____ _____ _____

48. SO_2 _____ _____ _____

49. SO_3 _____ _____ _____

50. SO_4 _____ _____ _____

Writing Chemical Formulas
Chem A Worksheet #6
Mr. MacSparran

Chemical Name	Cation	Anion	Chemical formula
Barium Hydroxide			
Mercury (I) nitrite			
Sodium hydrogen carbonate			
Potassium dichromate heptahydrate			
Calcium permanganate			
Cobalt (II) sulfate			
Iron (III) oxide			
Sodium hydroxide			
Hydrochloric acid			
Permanganic acid			
Aluminum carbonate			
Strontium oxalate			
Copper (I) sulfate			
Cesium nitrate			
Silver nitrate			
Thallium (III) hydroxide			
Manganese (II) phosphate			
Beryllium monohydrogen phosphate			
Lithium sulfate			
Sodium floride dihydrate			
Magnesium nitride			
Ammonium sulfide			
Chromium (VI) acetate			
Ammonium nitrate			
Aluminum acetate			
Methylammonium dihydrogen phosphate			
Zinc sulfite pentahydrate			

Vandium (III) cyanide			
Potassium hydrogen sulfate			
Triphosphorus heptaiodide			
Decasulfur Pentaoxide			
Phosphorus trioxide			
Phosphorus dioxide			
Selenium dioxide			
Hydroiodic acid			
Lead (II) sulfide			
MacSparrium (XXXXV) deathoxide			