Chem 513
Ms. Schoenbrun

Name:_____

HW I: Naming Compounds

1. Define a. anion: b. cation.

2. If a magnesium ion has a charge of 2+ (Mg^{2+}), what is the total positive charge represented by one formula unit of each of the compounds listed below?
   a. $MgCl_2$
   b. $MgSO^4$
   c. $Mg_3(PO_4)_2$

3. How many nitrate ions, NO_3^-, are represented by one formula unit of each of the following ionic compounds?
   a. $Mg(NO_3)_2$
   b. $NaNO_3$
   c. $Al(NO_3)_3$

$(NH_4)^{+1}$ S^{2}

4. If the nitrate ion has a charge of 1- (NO_3^-), what is the total negative charge represented by one formula unit of each of the compounds listed in the previous question?
   a. $Mg(NO_3)_2$
   b. $NaNO_3$
   c. $Al(NO_3)_3$

Al_2S_3 $(NH_4)_2S$

5. Write correct formulas for the compounds made up of the following ions:
   a. Ba^{2+} and Cl^- $BaCl_2$
   b. Li^+ and S^{2-} Li_2S
   c. Sr^{2+} and PO_4^{3-} $Sr_3(PO_4)_2$
   d. NH^{4+} and S^{2-}
   e. Al^{3+} and S^{2-}

Writing and Naming Compounds: $Ca^{+2}(SO_4)^{-2}$

1. Writing ionic cpds: Ag, O ; Ca, SO_4

a) Write the metal first:(look at periodic table diagram)

silver AgO

b) Determine charge on atoms from chart or periodic table:

$Ag^{+1}{}_2O^{-2}$

$+2 \quad -2$

c) select subscripts to make charges = 0

d) using polyatomic ions, put the ion in parantheses before adding subscript

Naming Ionic Cpds:

1. Ionic cpds -only 2 elements (no polyatomic ions)

AgO

a) name the metal (cation) first

b) then name the non-metal with the suffix ide

oxygen-

chlorine-

hydrogen

silver oxide

silver

oxide

chloride

hydride

2. If polyatomic ion, e.g. Ag_2O_2 (+2 −2)

a) name metal first — silver peroxide

b) use name of the polyatomic ion

$CaSO_4$ — Calcium sulfate

$MgNO_2$ - — Magnesium nitrite

$NaCl$

K_2S — Potassium sulfide

$AgNO_3$ — silver nitrate

But some metals form 2 kinds of ions
e.g. Cu^{+1} and Cu^{+2}

$CuCl$ $CuCl_2$

Write the formulas:

cuprous chloride
cupric chloride

But to name:
Traditional: lower charge - suffix ous
higher charge - suffix ic

Stock System: name by charges:
Cu^{+1} = copper(I) chloride CuCl

Cu^{+2} = copper(II) chloride $CuCl_2$

The Traditional System and Stock System for Naming Certain Ions

Element		Ion		
Symbol	Name	Symbol	Name	
			Traditional	Stock System
Cu	copper	Cu^{1+} Cu^{2+}	cuprous cupric	copper (I) copper (II)
Fe	iron	Fe^{2+} Fe^{3+}	ferrous ferric	iron (II) iron (III)
Hg	mercury	Hg_2^{2+} Hg^{2+}	mercurous mercuric	mercury (I) mercury (II)
Pb	lead	Pb^{2+} Pb^{4+}	plumbous plumbic	lead (II) lead (IV)
Sn	tin	Sn^{2+} Sn^{4+}	stannous stannic	tin (II) tin (IV)

Chemistry Name _____
Worksheet

Naming and Writing Ionic Compounds

1. Write the formula for each compound:

a) barium chloride $BaCl_2$ b) calcium oxide CaO

c) magnesium sulfate $MgSO_4$ d) silver bromide $AgBr$

e) zinc carbonate $ZnCO_3$ f) lithium nitrite $LiNO_2$

H_2O (3)

2. Name these compounds:

a) $NaHCO_3$ Sodium bicarbonate

b) K_2O_2 Potassium Peroxide

c) $HgCl_2$ Mercury (II) chloride mercuric

d) $Fe(OH)_3$ Ferric Hydroxide Iron(III) hydr

e) $Ni(C_2H_3O_2)_2$ Nickel (II) Acetate

3. Write the formula for each compound:

a) ammonium nitrate NH_4NO_3 b) aluminum sulfide Al_2S_3

c) copper II hydroxide _____ d) lead II phosphate _____

e) iron III sulfite _____ f) beryllium chromate _____

4. Name these compounds:

a) $CuCl$ _____

b) CaS _____

c) $KClO_3$ _____

d) $NaNO_2$ _____

e) $Ni_3(PO_4)_2$ _____