NAME: HONORS CHEMISTRY

SECTION: Chapter 5 Review Sheet

After studying chapter 5 (new textbook), you should be able to:

- Infer the charge on a monatomic ion using the periodic table.
- Classify compounds as either ionic or molecular.
- Define a polyatomic ion and memorize the names and formulas of common polyatomic ions.
- Determine the formula of an ionic compound formed between two given ions.
- Name an ionic compound (Type I, Type II, and ternary compounds) given its formula.
- Using prefixes, name a binary molecular compound (Type III) from its formula.
- Write the formula of a binary molecular compound given its name.
- Write the name of an acid from its formula; give the formula of an acid from its name

Problems for you to try:

1. Many chemical compounds have common names. Give the systematic names for each of the following
   a. Lime, CaO calcium oxide
   b. Chalcocite, Cu_2S copper(I) sulfide
   c. Alumina, Al_2O_3 alumium oxide
   d. Magnesia, MgO magnesium oxide
   e. Calcite, $CaCO_3$ calcium carbonate
   f. Sugar of lead, $Pb(C_2H_3O_2)_2$ lead(II) acetate
2. Name the following molecular compounds.
   a. SiO_2 silicon dioxide
   b. SO_2 sulfur dioxide
   c. CF_4 carbon tetrafluoride
   d. N_2O_3 dinitrogen trioxide
3. Write the formulas for the following compounds.
   a. iron (II) chlorate $Fe(ClO_3)_2$
   b. dimercury (I) acetate $Hg_2(C_2H_3O_2)_2$
   c. copper (II) phosphate $Cu_3(PO_4)_2$
   d. ammonium hydroxide NH_4OH
   e. potassium hydrogen phosphate (used in nondairy creamers) K_2HPO_4
   f. lithium sulfate (an antidepressant) Li_2SO_4
   g. titanium (III) sulfate (used as a stain remover) $Ti_2(SO_4)_3$
   h. chromium (III) phosphate (a green pigment) $CrPO_4$
   i. dinitrogen tetroxide N_2O_4
   j. phosphorus trichloride PCl_3
   k. dinitrogen pentoxide N_2O_5

4. Name the following pairs of compounds.

a. $SnCl_2$, $SnCl_4$ tin(II) chloride, tin(IV) chloride

b. MnO, MnO_2 manganese(II) oxide, manganese(IV) oxide

c. FeO, Fe_2O_3 iron(II) oxide, iron(III) oxide

d. N_2O, N_2O_4 dinitrogen monoxide, dinitrogen tetraoxide

e. SeF_6, IF_5 selenium hexafluoride, iodine pentafluoride

5. Write formulas for the following pairs of compounds.

a. Iron (III) sulfide, iron (III) sulfite Fe_2S_3, $Fe_2(SO_3)_3$

b. sulfur dichloride, sulfur pentachloride SCl_2, SCl_5

6. Complete the following table on acid nomenclature.

Acid Formula	Acid Name
HNO_3	Nitric acid
$HC_2H_3O_2$	Acetic acid
H_2SO_3	Sulfurous acid
$HClO_4$	Perchloric acid

7. The formulas MgO and CO look very similar. What is the name for each compound? Why do we name them differently?
Magnesium oxide, carbon monoxide MgO is an ionic compound, made from magnesium ions and oxide ions. CO is a molecular compound

8. What is the general formula for an ionic compound formed by elements in the following groups? Explain your reasoning and provide an example for each (name and formula)

a. group 1 with group 17 1:1, ex NaCl sodium chloride

b. group 2 with group 17 1:2, ex. $MgCl_2$ magnesium chloride

c. group 1 with group 16 2:1, ex. Na_2O sodium oxide

d. group 2 with group 16 1:1, ex. CaO calcium oxide

9. Why do we call $Ba(NO_3)_2$ barium nitrate but call $Fe(NO_3)_2$ iron(II) nitrate? Barium is a type I cation, so we don't need to specify its charge; iron is a type II cation, and its charge (+2) must be indicated with a Roman numeral

10. What is the difference between sulfuric acid and hydrosulfuric acid? H_2SO_4 is a ternary acid (an oxyacid) and H_2S is a binary acid