Chem 151 Drilling Question Set #1 (Answer Key)
Naming of Inorganic Compounds and Balancing Simple Reaction Equations

1. Write the chemical formula for each of the following compounds. Circle the names of all the polyatomic ions.

Silicon dioxide	***SiO_2***
Ammonium carbonate	***$(NH_4)_2CO_3$***
Calcium iodide	***CaI_2***
Lanthanum(III) sulfide	***La_2S_3***
Dinitrogen trioxide	***N_2O_3***
Cesium sulfate	***Cs_2SO_4***

2. Give the systematic name for each of the following compounds. Circle all the compounds with high ionic characters (that is, they are named as ionic compounds).

CuS	***Copper(II) sulfide***
Cl_2O_7	***chlorine heptaoxide or dichlorine heptaoxide***
Na_2O_2	***sodium peroxide***
SeF_6	***selenium hexafluoride***
$Fe(HCO_3)_2$	***Ferrous bicarbonate or Iron(II) hydrogen carbonate***

3. For each of the following inorganic acids, give a systematic name to the anion, then, name the acid.

H_3PO_4	***phosphate***	***phosphoric acid***
$HBrO_3$	***bromate***	***bromic acid***
$HBrO_4$	***perbromate***	***perbromic acid***
HNO_2	***nitrite***	***nitrous acid***
H_2SO_3	***sulfite***	***sulfurous acid***
HI (aq)	***iodide***	***hydroiodic acid***
HCN (aq)	***cyanide***	***hydrocyanic acid***

Guess what… (Without looking up your notes for an answer, based on what you have learned to make an educational guess, then, answer the question below.)

4. Knowing that a phosphate ion is PO_4^{3-}, what is the formula of an arsenate ion? What is the formula of an arsenite ion?

Since P and As belong to the same group in the periodic chart, the formula of an arsenate ion should be AsO_4^{3-}. I also further guess that an arsenite ion should have less number of oxygen atoms than arsenate, so the formula of an arsenite ion should be AsO_3^{3-}.

5. Balance the following reaction equations:

a. $2\ KClO_3 \rightarrow 2\ KCl + 3\ O_2$

b. $2\ KNO_3 \rightarrow 2\ KNO_2 + O_2$

c. $P_4O_{10} + 6\ H_2O \rightarrow 4\ H_3PO_4$

d. $2\ H_2O_2 \rightarrow 2\ H_2O + O_2$

e. $Fe_2O_3 + 3\ CO \rightarrow 2\ Fe + 3\ CO_2$

f. $2\ NaOH + H_2SO_4 \rightarrow 2\ H_2O + Na_2SO_4$

g. $2\ GaCl_3 + 3\ BaSO_4 \rightarrow 3\ BaCl_2 + Ga_2(SO_4)_3$

h. $2\ Al + 3\ H_2SO_4 \rightarrow Al_2(SO_4)_3 + 3\ H_2$