CHEM 106 Chapter 7 – Classification of Reactions

1. Complete the acid-base reactions below.

$HCl(aq) + KOH(aq) \rightarrow$

$H_2SO_4(aq) + NaOH(aq) \rightarrow$

$HNO_3(aq) + Al(OH)_3(aq) \rightarrow$

2. Identify each of the following equations as belonging to one or more of the following categories: precipitation, acid-base, or oxidation-reduction.

_____ a. $K_2SO_4(aq) + Ba(NO_3)_2(aq) \rightarrow BaSO_4(s) + KNO_3(aq)$

_____ b. $HCl(aq) + Zn(s) \rightarrow H_2(g) + ZnCl_2(aq)$

_____ c. $HCl(aq) + AgNO_3(aq) \rightarrow HNO_3(aq) + AgCl(s)$

_____ d. $HCl(aq) + KOH(aq) \rightarrow H_2O(l) + KCl(aq)$

_____ e. $Zn(s) + CuSO_4(aq) \rightarrow ZnSO_4(aq) + Cu(s)$

_____ f. $NaH_2PO_4(aq) + NaOH(aq) \rightarrow Na_3PO_4(aq) + H_2O(l)$

_____ g. $Ca(OH)_2(aq) + H_2SO_4(aq) \rightarrow CaSO_4(s) + H_2O(l)$

_____ h. $ZnCl_2(aq) + Mg(s) \rightarrow Zn(s) + MgCl_2(aq)$

_____ i. $BaCl_2(aq) + H_2SO_4(aq) \rightarrow BaSO_4(s) + HCl(aq)$

3. Identify each of the following equations as belonging to one or more of the following categories: precipitation, acid-base, or oxidation-reduction.

_____ a. $H_2O_2(aq) \rightarrow H_2O(l) + O_2(g)$

_____ b. $H_2SO_4(aq) + Zn(s) \rightarrow ZnSO_4(aq) + H_2(g)$

_____ c. $H_2SO_4(aq) + NaOH(aq) \rightarrow Na_2SO_4(aq) + H_2O(l)$

_____ d. $H_2SO_4(aq) + Ba(OH)_2(aq) \rightarrow BaSO_4(s) + H_2O(l)$

_____ e. $AgNO_3(aq) + CuCl_2(aq) \rightarrow Cu(NO_3)_2(aq) + AgCl(s)$

_____ f. $KOH(aq) + CuSO_4(aq) \rightarrow Cu(OH)_2(s) + K_2SO_4(aq)$

_____ g. $Cl_2(g) + F_2(g) \rightarrow ClF(g)$

_____ h. $NO(g) + O_2(g) \rightarrow NO_2(g)$

_____ i. $Ca(OH)_2(s) + HNO_3(aq) \rightarrow Ca(NO_3)_2(aq) + H_2O(l)$

4. For any reaction in 2 that was oxidation-reduction (redox) give any other classification it falls into (e.g. synthesis).

5. Classify each redox reaction below as synthesis, decomposition or single replacement. If it doesn't fit a classification, specify "none."

_____ a. $Al(s) + Br_2(l) \rightarrow AlBr_3(s)$

_____ b. $Zn(s) + HClO_4(aq) \rightarrow Zn(ClO_4)_2(aq) + H_2(g)$

_____ c. $Na(s) + P(s) \rightarrow Na_3P(s)$

_____ d. $CH_4(g) + Cl_2(g) \rightarrow CCl_4(l) + HCl(g)$

_____ e. $Cu(s) + AgNO_3(aq) \rightarrow Cu(NO_3)_2(aq) + Ag(s)$