Types of Reactions Worksheet #1

Complete the following reactions. Write all names, include states of matter when appropriate. Write all formulas, write both molecular and net-ionic equations, balance, and identify the type of reaction (the reaction may be classified as more than one type). Be sure to note if the reaction does not occur and why (due to activity series or all spectator ions). All reactants in double displacement reactions are aqueous.

1. Magnesium hydroxide + nitric acid → **water and meagnesium nitrate**

Type(s): **double displacement** Does a reaction occur? **yes**

Molecular: **$Mg(OH)_2$ (s) + $2HNO_3$ (aq) → $2H_2O$ (l) + $Mg(NO_3)_2$ (aq)**

Complete ionic **$Mg(OH)_2$ (s) + $2H^+$ + $2NO_3^-$ → $2H_2O$ (l) + Mg^{+2} + $2NO_3^-$**

Net ionic: **$Mg(OH)_2$ (s) + $2H^+$ → $2H_2O$ (l) + Mg^{+2}**

2. Complete combustion of methane (CH_3OH)

Type(s): **combustion** Does a reaction occur? **yes**

Molecular: **$2CH_3OH$ (l) + $3O_{2\ (g)}$ → $2CO_{2\ (g)}$ + $4H_2O$ (l)**

Complete ionic: **none**

Net ionic: **none**

3. potassium carbonate + nitric acid → **ammonium chloride and bromine**

Type(s): **single displacement/redox** Does a reaction occur? **Yes**

Molecular: **Cl_2 (g) + $2NH_4Br$ (aq) → $2NH_4Cl$ (aq) + Br_2 (g)**

Complete ionic: **Cl_2 (g) + $2NH_4^+$ + $2Br^-$ → $2NH_4^+$ + $2Cl^-$ + Br_2 (g)**

Net ionic: **Cl_2 (g) + $2Br^-$ → $2Cl^-$ + Br_2 (g)**

4. Aluminum + sulfurous acid → **hydrogen and aluminum sulfite**

Type(s): single displacement/redox Does a reaction occur? yes

Molecular: **2Al (s) + $3H_2SO_3$ (aq) → $3H_2$ (g) + $Al_2(SO_3)_3$ (s)**

Complete ionic: **2Al (s) + $3H_2SO_3$ (aq) → $3H_2$ (g) + $Al_2(SO_3)_3$ (s)**

Net ionic: **same as complete– no spectator ions**