Worksheet - Balancing Chemical Equations

This worksheet requires prior knowledge of nomenclature/formula writing skills of a variety of compounds. If you haven't already done so, or need more practice, return to this concept development topic. Part B of this assignment also incorporates types of chemical reactions studied in this unit. If you need to become more familiar with the various types of chemical reactions, don't hesitate to review this concept development topic.

PART A - Write the proper formulas for the equations below and balance them by placing the correct whole number coefficients in front of each formula.

1. sodium + oxygen ---> sodium oxide
2. ammonium + nitrite ---> nitrogen + water
3. sodium + oxygen ---> sodium peroxide
4. potassium chlorate ---> potassium chloride + oxygen
5. magnesium + oxygen ---> magnesium oxide
6. magnesium oxide + water ---> magnesium hydroxide
7. aluminum + sulphuric acid ---> aluminum sulphate + hydrogen
8. copper + nitric acid ---> copper (II) nitrate + nitrogen monoxide + water
9. ~~sodium hydroxide + hydrochloric acid ---> aluminum chloride + hydrogen~~
10. chlorine + carbon tetrahydride ---> hydrogen chloride + carbon tetrachloride

PART B - Balance the following equations by placing correct whole number coefficients in the blanks. Also identify what type of chemical reaction is occurring.

1. ____ $Ca(OH)_{2(s)}$ + 2 $HCL_{(aq)}$ ---> ____ $CaCL_{2(aq)}$ + 2 $H_2O_{(l)}$ double-replacement
2. 2 $FeCl_{3(aq)}$ + 3 $(NH_4)_2S_{(aq)}$ ---> ____ $Fe_2S_{3(s)}$ + 6 $NH_4Cl_{(aq)}$ double-replacement
3. 2 $KNO_{3\,(s)}$ ---> 2 $KNO_{2\,(s)}$ + ____ $O_{2(g)}$ decomposition
4. 2 $Ag_2O_{(s)}$ ---> 4 $Ag_{(s)}$ + ____ $O_{2(g)}$ decomposition
5. 2 $C_4H_{10(g)}$ + 13 $O_{2(g)}$ ---> 8 $CO_{2(g)}$ + 10 $H_2O_{(g)}$ combustion
6. ____ $Br_{2(aq)}$ + 2 $KI_{(aq)}$ ---> ____ $I_{2(aq)}$ + 2 $KBr_{(aq)}$ double-replacement
7. ~~____ $AsCl_{3(aq)}$ + ____ $H_2S_{\,(aq)}$ ---> ____ $As_2S_{3\,(s)}$ + ____ $H_2O_{\,(g)}$~~
8. 2 $C_5H_{12}O_{\,(l)}$ + 15 $O_{2(g)}$ --> 10 $CO_{2(g)}$ + 12 $H_2O_{\,(g)}$ combustion
9. 2 $Al_{(s)}$ + 3 $H_2SO_{4\,(aq)}$ ---> ____ $Al_2(SO_4)_{3(aq)}$ + 3 $H_{2(g)}$ single-replacement
10. 2 $Fe_{(s)}$ + 3 $Cl_{2(g)}$ ---> 2 $FeCl_{3(s)}$ single-replacement

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Part A

① $4Na + O_2 \rightarrow 2Na_2O$

② $NH_4^+ + NO_2^- \rightarrow N_2 + 2H_2O$

③ $Na + O_2 \rightarrow NaO_2$

④ $2KClO_3 \rightarrow 2KCl + 3O_2$

⑤ $2Mg + O_2 \rightarrow 2MgO$

⑥ $MgO + H_2O \rightarrow Mg(OH)_2$

⑦ $2Al + 3H_2SO_4 \rightarrow Al_2(SO_4)_3 + 3H_2$

⑧ $3Cu + 8HNO_3 \rightarrow 3Cu(NO_3)_2 + 2NO + 4H_2O$

⑩ $2Cl_2 + CH_4 \rightarrow 4HCl + CCl_4$