Ionic Equation Worksheet

Write balanced molecular, total ionic, and net ionic equations for each of the following.

1. Aqueous sodium hydroxide reacts with aqueous copper(II) sulfate to precipitate copper(II) hydroxide.

2. Aqueous potassium carbonate reacts with aqueous silver nitrate to precipitate silver carbonate.

3. Sulfuric acid reacts to neutralize aqueous sodium hydroxide.

4. Hydrochloric acid dissolves solid aluminum hydroxide.

5. Aqueous hydrofluoric acid (a weak acid) reacts with aqueous barium nitrate to form barium fluoride precipitate.

6. Solid nickel reacts with aqueous lead(II) nitrate to form solid lead [and nickel(II) nitrate].

7. Sold magnesium reacts with iodic acid to release hydrogen gas.

8. Aqueous barium hydroxide reacts with sulfuric acid to precipitate barium sulfate.

9. Aqueous sodium phosphate reacts with aqueous calcium chloride to precipitate calcium phosphate.

10. Solid magnesium carbonate dissolves in nitric acid to produce carbon dioxide gas.

Ionic Equation Worksheet Answers

1. $2\ NaOH(aq) + CuSO_4(aq) \longrightarrow Na_2SO_4(aq) + Cu(OH)_2(s)$
   $2\ Na^+ + 2\ OH^- + Cu^{2+} + SO_4^{2-} \longrightarrow 2\ Na^+ + SO_4^{2-} + Cu(OH)_2(s)$
   $Cu^{2+} + 2\ OH^- \longrightarrow Cu(OH)_2(s)$

2. $K_2CO_3(aq) + 2\ AgNO_3(aq) \longrightarrow 2\ KNO_3(aq) + Ag_2CO_3(s)$
   $2\ K^+ + CO_3^{2-} + 2\ Ag^+ + 2\ NO_3^- \longrightarrow 2\ K^+ + 2\ NO_3^- + Ag_2CO_3(s)$
   $2\ Ag^+ + CO_3^{2-} \longrightarrow Ag_2CO_3(s)$

3. $H_2SO_4(aq) + 2\ NaOH(aq) \longrightarrow Na_2SO_4(aq) + 2\ H_2O(l)$
   $2\ H^+ + SO_4^{2-} + 2\ Na^+ + 2\ OH^- \longrightarrow 2\ Na^+ + SO_4^{2-} + 2\ H_2O(l)$
   $H^+ + OH^- \longrightarrow H_2O(l)$

4. $3\ HCl(aq) + Al(OH)_3(s) \longrightarrow 3\ H_2O(l) + AlCl_3(aq)$
   $3\ H^+ + 3\ Cl^- + Al(OH)_3(s) \longrightarrow 3\ H_2O(l) + Al^{3+} + 3\ Cl^-$
   $3\ H^+ + Al(OH)_3(s) \longrightarrow 3\ H_2O(l) + Al^{3+}$

5. $2\ HF(aq) + Ba(NO_3)_2(aq) \longrightarrow 2HNO_3(aq) + BaF_2(s)$
   $2\ HF(aq) + Ba^{2+} + 2\ NO_3^- \longrightarrow 2\ H^+ + 2\ NO_3^- + BaF_2(s)$
   $2\ HF(aq) + Ba^{2+} \longrightarrow 2\ H^+ + + BaF_2(s)$

6. $Ni(s) + Pb(NO_3)_2(aq) \longrightarrow Ni(NO_3)_2(aq) + Pb(s)$
   $Ni(s) + Pb^{2+} + 2\ NO_3^- \longrightarrow Ni^{2+} + 2\ NO_3^- + Pb(s)$
   $Ni(s) + Pb^{2+} \longrightarrow Ni^{2+} + Pb(s)$

7. $Mg(s) + 2\ HIO_3(aq) \longrightarrow Mg(IO_3)_2(aq) + H_2(g)$
   $Mg(s) + 2\ H^+ + 2\ IO_3^- \longrightarrow Mg^{2+} + 2\ IO_3^- + H_2(g)$
   $Mg(s) + 2\ H^+ \longrightarrow Mg^{2+} + H_2(g)$

8. $Ba(OH)_2(aq) + H_2SO_4(aq) \longrightarrow BaSO_4(s) + 2\ H_2O(l)$
   $Ba^{2+} + 2\ OH^- + 2\ H^+ + SO_4^{2-} \longrightarrow BaSO_4(s) + 2\ H_2O(l)$
   $Ba^{2+} + 2\ OH^- + 2\ H^+ + SO_4^{2-} \longrightarrow BaSO_4(s) + 2\ H_2O(l)$

9. $2\ Na_3PO_4(aq) + 3\ CaCl_2(aq) \longrightarrow 6\ NaCl(aq) + Ca_3(PO_4)_2(s)$
   $6\ Na^+ + 2\ PO_4^{3-} + 3\ Ca^{2+} + 6\ Cl^- \longrightarrow 6\ Na^+ + 6\ Cl^- + Ca_3(PO_4)_2(s)$
   $3\ Ca^{2+} + 2\ PO_4^{3-} \longrightarrow Ca_3(PO_4)_2(s)$

10. $MgCO_3(s) + 2\ HNO_3(aq) \longrightarrow Mg(NO_3)_2(aq) + H_2O(l) + CO_2(g)$
    $MgCO_3(s) + 2\ H^+ + 2\ NO_3^- \longrightarrow Mg^{2+} + 2\ NO_3^- + H_2O(l) + CO_2(g)$
    $MgCO_3(s) + 2\ H^+ \longrightarrow Mg^{2+} + H_2O(l) + CO_2(g)$