Write a balanced chemical equation for each of the following combination reactions. Assume all reactions occur. When the identity of the product is not given write the formula of the most likely product, and give the name of that product.

1. Nitrogen reacts with hydrogen to produce ammonia.

2. Calcium reacts with oxygen

3. Phosphorus is heated in air to produce tetraphosphorus decoxide.

4. Carbon reacts with bromine to produce carbon tetrabromide.

5. Aluminum reacts with fluorine.

6. Hydrogen reacts with oxygen to form water.

7. Magnesium is heated in air to form an oxide.

8. Potassium reacts with chlorine.


10. Iron reacts with sulfur to form a ferric compound.

11. Nitrogen reacts with oxygen to produce dinitrogen trioxide.

12. Copper reacts with iodine to produce a cuprous compound.

13. Xenon reacts with fluorine to produce xenon hexafluoride.
EQUATION WRITING (2) - Decomposition Reactions
Write a balanced chemical equation to show the decomposition of each of the following compounds into its elements.

1. water

2. tetraphosphorus decoxide

3. hydrogen bromide

4. dinitrogen pentoxide

5. tetraphosphorus trisulfide

6. sulfur dioxide

7. lithium nitride

8. aluminum bromide

9. magnesium phosphide

10. ammonia

11. aluminum oxide

12. sodium chloride

13. sulfur hexafluoride

14. plumbic sulfide
EQUATION WRITING (3) - Combinations and Decompositions

Write a completed, balanced chemical equation for each reaction. Assume all reactions occur and that decompositions produce pure elements. If not specified, combinations produce the products expected from locations of the elements in the Periodic Table.

1. Silver oxide decomposes.

2. Aluminum oxide is decomposed

3. Zinc reacts with nitrogen.

4. Hydrogen chloride is decomposed

5. Barium phosphide decomposes.

6. Sulfur is heated in air to produce sulfur trioxide.

7. Dinitrogen pentoxide is strongly heated until it decomposes.


9. Lithium reacts with phosphorus.

10. Calcium reacts with iodine.

11. Ferric bromide is decomposed.

12. Lead reacts with sulfur to produce plumbic sulfide.

13. Carbon dioxide reacts with water to form carbonic acid.

14. Calcium oxide reacts with water to form calcium hydroxide.
EQUATION WRITING (4) - Single Replacement Reactions

Write a completed balanced chemical equation for each of the following reactions. Assume a reaction occurs in each instance and that the reaction is a single replacement.

1. A piece of calcium metal is dropped into warm water.

2. Chlorine gas is bubbled through a solution containing potassium sulfide.

3. A piece of iron is dropped into a hydrochloric acid solution; a ferric compound forms.

4. Liquid bromine is mixed with a solution of aluminum iodide.

5. A piece of aluminum metal is dropped into a phosphoric acid solution.

6. Zinc metal pellets are dropped into a warm solution of lead(II) chloride.

7. A piece of copper is added to a solution containing silver nitrate; a cupric compound forms.

8. A piece of magnesium metal is dropped into hot water.

9. Pure liquid bromine is added to a zinc iodide solution.

10. A solution of warm acetic acid flows through a piece of lead pipe; a lead(II) compound forms.
EQUATION WRITING (5) - Combinations, Decompositions, Single Replacements

Write a balanced equation, and name the TYPE, for each of the following reactions.

1. Tin(IV) oxide is decomposed by electrolysis.

2. Nitrogen reacts with hydrogen to form ammonia.

3. A piece of silver metal is dropped into a solution containing lead(II) nitrate.

4. Iron reacts with warm chlorine gas to produce a compound of iron(III).

5. A piece of sodium metal is dropped into water.

6. Chlorine gas is bubbled through a solution containing aluminum iodide.

7. Sodium nitride is decomposed by electrolysis.

8. A piece of aluminum is dropped into a solution of nitric acid.

9. Ammonia is decomposed to its elements.

10. Sulfur is burned in air, to produce sulfur trioxide.

11. Nitrogen is reacted with hydrogen to form dinitrogen tetrahydride (hydrazine).

12. A piece of iron is added to a solution of cupric sulfate, to form a ferric compound.
EQUATION WRITING (6) - Double Replacement Reactions

Write a balanced equation for each reaction. Underline any solid product (precipitate) that forms. (All solutions are in water.)

1. Solutions of hydrochloric acid and sodium hydroxide are mixed

2. Solutions of barium chloride and ammonium sulfate are mixed.

3. Solutions of silver nitrate and magnesium chloride are mixed.

4. Solutions of cupric acetate and potassium carbonate are mixed.

5. Solutions of phosphoric acid and sodium hydroxide are mixed

6. Solutions of sodium phosphate and lead(II) nitrate are mixed.

7. Solutions of iron(II) chloride and potassium hydroxide are mixed

8. Solutions of sodium carbonate and sulfuric acid are mixed.

9. Solutions of aluminum sulfate and sodium hydroxide are mixed.

10. Solutions of carbonic acid and lithium hydroxide are mixed.

11. Solutions of aluminum acetate and sodium hydroxide are mixed

12. Solutions of lead(II) nitrate and potassium chloride are mixed.

13. Solutions of ferrous sulfate and barium nitrate are mixed

14. Solutions of hydrochloric acid and sodium bicarbonate are mixed.
1. Aqueous solutions of potassium hydroxide and sulfuric acid are mixed.

2. Aqueous solutions of calcium chloride and silver nitrate are mixed.

3. A nitric acid solution is used to dissolve solid iron(III) carbonate.

4. Aqueous solutions of zinc sulfate and sodium hydroxide are mixed.

5. Aqueous solutions of barium chloride and phosphoric acid are mixed.

6. An electrical current is passed through liquid potassium oxide to decompose it.

7. A piece of aluminum is dropped into an aqueous solution of ferrous sulfate.

8. Magnesium metal is burned in air.

9. A piece of calcium metal is dropped into warm water.

10. Solid aluminum carbonate is added to a solution of acetic acid.

11. Iron metal is oxidized in air to form ferric oxide.
EQUATION WRITING (8) - Redox Reactions

Write a completed, balanced equation for each reaction. Identify which atom or ion is being oxidized, and which is being reduced. Assume all reactions occur.

1. Nitrogen reacts with hydrogen to form ammonia.

2. Tin metal reacts with an aqueous solution of silver nitrate and a tin(II) compound forms.

3. A piece of zinc metal is added to a solution of hydrobromic acid.

4. Sodium metal reacts with molten (i.e., melted) sulfur.

5. A piece of calcium metal is added to a solution of sulfuric acid.

6. Barium metal is added to hot water.

7. Gaseous chlorine is bubbled through an aqueous solution of potassium iodide.
Write a net ionic equation for each reaction below.

1. Aqueous solutions of barium chloride and ammonium sulfate are mixed.

2. Aqueous solutions of silver nitrate and magnesium chloride are mixed.

3. Aqueous solutions of cupric acetate and potassium carbonate are mixed.

4. Aqueous solutions of phosphoric acid and potassium hydroxide are mixed.

5. Aqueous solutions of sodium phosphate and lead(II) nitrate are mixed.

6. Aqueous solutions of ferrous chloride and silver sulfate are mixed.

7. Aqueous solutions of aluminum nitrate and potassium hydroxide are mixed.

8. Aqueous solutions of calcium acetate and sodium phosphate are mixed.

9. Aqueous solutions of hydrochloric acid and ammonium hydroxide are mixed.

10. Aluminum metal is added to a solution of hydrochloric acid.

11. Zinc metal is added to a solution of copper(II) sulfate.