



Chemical Reactions

Grade 10 Science

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Practicing Chemical Equations

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Practicing Types of Reactions

Practice writing word, skeleton, and balanced equations based on the reactants or products and the type of reaction.

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Practicing Word Equations

Write **word** equations for each of the following chemical reactions.

Note: “aqueous” means that the chemical is dissolved in a solution.

1. Aluminum and hydrochloric acid react to produce aluminum chloride and hydrogen gas.
2. Water and carbon dioxide gas are produced when ethane burns in oxygen.
3. Magnesium metal burns in oxygen gas with a bright white light to make a white powder called magnesium oxide.
4. Gaseous hydrogen and gaseous oxygen react explosively to form water vapor.
5. A solution of sodium iodide is added to a solution of potassium nitrate to make a potassium iodide precipitate and a sodium nitrate solution.
6. When zinc metal and sulfur powder are heated, they form solid zinc sulfide.
7. Aluminum metal plus hydrogen chloride gas yields solid aluminum chloride plus hydrogen gas.

8. Zinc metal plus oxygen gas produces solid zinc oxide.
9. Magnesium metal plus gaseous carbon dioxide yields solid magnesium oxide plus solid carbon.
10. Sodium metal plus chlorine gas combine to form solid sodium chloride.
11. Water vapour is formed from hydrogen gas and oxygen gas.
12. Silverware reacts with the sulfur in the air to become tarnished, producing silver sulfide.
13. Iron reacts with the oxygen in the air to form rust (which is iron oxide).
14. When sodium metal is placed in a beaker of water, hydrogen gas and a sodium hydroxide solution are formed.
15. When zinc metal is placed in a solution of hydrochloric acid, hydrogen gas and a zinc chloride solution are formed.
16. A sodium chloride solution reacts with a lead (II) nitrate solution to yield a lead (II) chloride precipitate and aqueous sodium nitrate.



17. Aqueous barium nitrate reacts with sulfuric acid to yield a barium sulfate precipitate and nitric acid.

18. Silver nitrate reacts in solution with potassium chromate to yield a silver chromate precipitate and soluble potassium nitrate.

19. Solid calcium carbonate reacts with hydrochloric acid [HCl(aq)] to yield aqueous calcium chloride, carbon dioxide gas, and liquid water.

20. Aqueous zinc chloride reacts with hydrogen sulfide gas to yield a zinc sulfide precipitate and hydrochloric acid.

21. magnesium nitrate reacts in solution with potassium hydroxide to yield a magnesium hydroxide precipitate and soluble potassium nitrate.

22. solid aluminum hydroxide reacts with nitric acid to yield soluble aluminum nitrate and liquid water.

23. aqueous lead (IV) nitrate reacts with aqueous sodium sulfate to yield a lead (IV) sulfate precipitate and soluble sodium nitrate.

24. Aqueous sodium hydroxide reacts with carbon dioxide gas to yield soluble sodium carbonate and liquid water.

25. Solid magnesium oxide reacts with hydrochloric acid to yield a solution of magnesium chloride and liquid water.

26. Solid zinc metal reacts with sulfuric acid to yield aqueous zinc sulfate and hydrogen gas.

27. Solid ferric oxide reacts with solid aluminum metal to yield solid aluminum oxide and solid iron metal.

28. Aqueous hydrogen peroxide produces water and oxygen.

29. Hydrogen gas and nitrogen gas react to form ammonia.

30. Sodium phosphate and calcium chloride react to form calcium phosphate and sodium chloride.

31. Magnesium reacts with nitrogen gas to produce magnesium nitride.

32. Silver (I) nitrate reacts with copper to form copper (II) nitrate and silver.

33. When heated, calcium carbonate decomposes to form calcium oxide and carbon dioxide.

34. Ammonia reacts with hydrogen chloride to form ammonium chloride.



Practicing Chemical Equations

For the following reactions, write the **word**, **skeleton** and **balanced** chemical equations.

1. Sulfur trioxide and water combine to make sulfuric acid.

word

skeleton

balanced

2. Lead (II) nitrate and sodium iodide react to make lead (II) iodide and sodium nitrate.

word

skeleton

balanced

3. Calcium fluoride and sulfuric acid (H_2SO_4) make calcium sulfate and hydrofluoric acid (hydrogen fluoride).

word

skeleton

balanced

4. Calcium carbonate will come apart when you heat it to leave calcium oxide and carbon dioxide.

word

skeleton

balanced

5. Sodium carbonate and water are produced when sodium hydroxide neutralizes carbonic acid.

word

skeleton

balanced

6. Zinc sulfide and oxygen become zinc oxide and sulfur.

word

skeleton

balanced

7. Lithium oxide and water make lithium hydroxide.

word

skeleton

balanced

8. Aluminum hydroxide and sulfuric acid neutralize to make water and aluminum sulfate.

word

skeleton

balanced

9. Sulfur burns in oxygen to make sulfur dioxide.

word

skeleton

balanced

10. Barium hydroxide and sulfuric acid make water and barium sulfate.

word

skeleton

balanced



11. Aluminum sulfate and calcium hydroxide become aluminum hydroxide and calcium sulfate.
- word
skeleton
balanced
12. Copper metal and silver nitrate react to form silver metal and copper (II) nitrate.
- word
skeleton
balanced
13. Sodium metal and chlorine react to make sodium chloride.
- word
skeleton
balanced
14. Calcium phosphate and sulfuric acid make calcium sulfate and phosphoric acid.
- word
skeleton
balanced
15. Sodium phosphate and water are created when phosphoric acid (H_3PO_4) is added to sodium hydroxide.
- word
skeleton
balanced
16. Propane (C_3H_8) completely burns in the presence of oxygen to produce carbon dioxide and water.
- word
skeleton
balanced

17. Zinc and copper (II) sulfate react to yield zinc sulfate and copper metal.

word

skeleton

balanced

18. Sulfuric acid reacts with zinc to produce zinc sulfate and hydrogen.

word

skeleton

balanced

19. If you add hot steam to methane (CH_4), you will get hydrogen and carbon dioxide.

word

skeleton

balanced

20. Calcium oxide and aluminum make aluminum oxide and calcium.

word

skeleton

balanced

21. Sodium chloride and bromine are produced when chlorine gas and sodium bromide are mixed together.

word

skeleton

balanced

22. Hydrogen peroxide (H_2O_2) decomposes into water and oxygen.

word

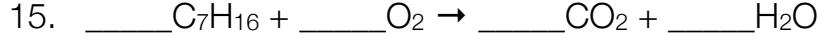
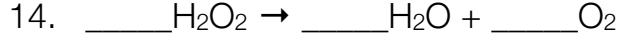
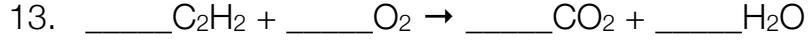
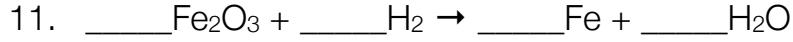
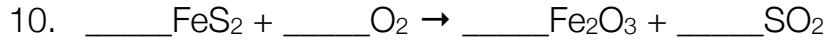
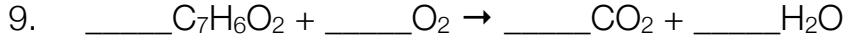
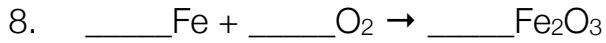
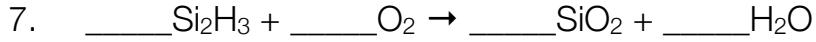
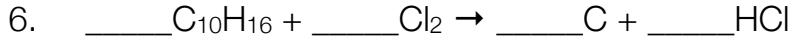
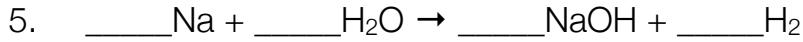
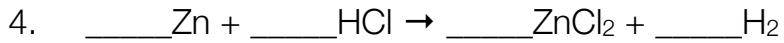
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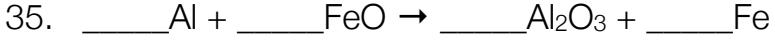
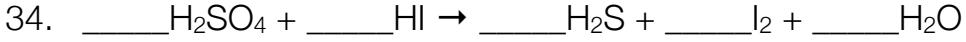
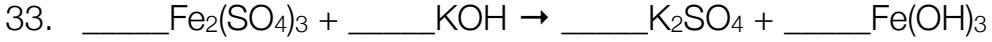
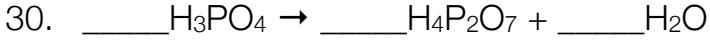
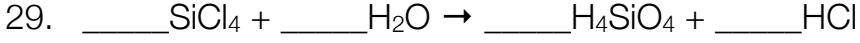
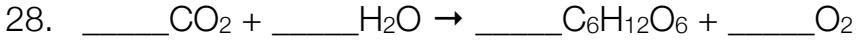
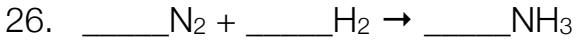
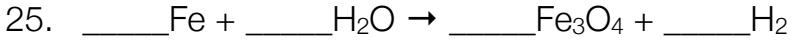
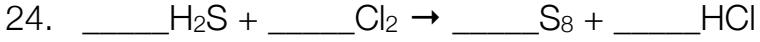
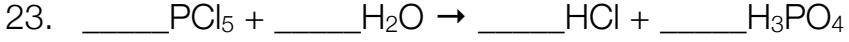
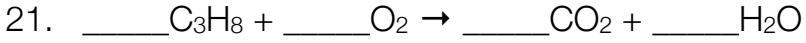
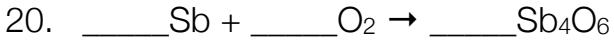
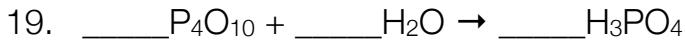
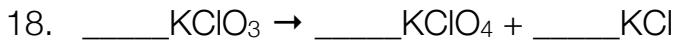
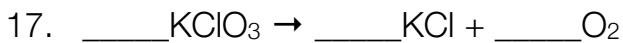
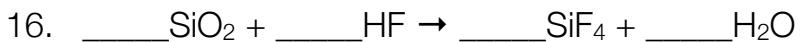
balanced



Practicing **Balancing** Equations

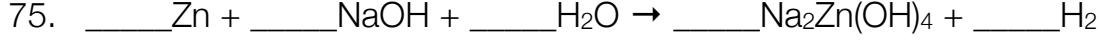
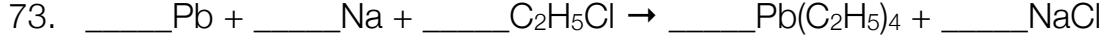
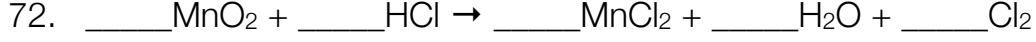
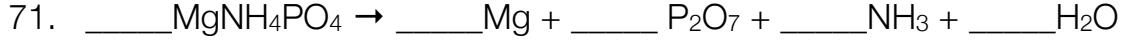
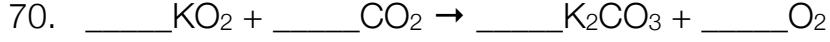
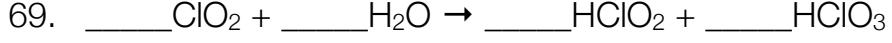
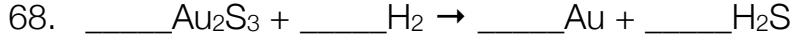
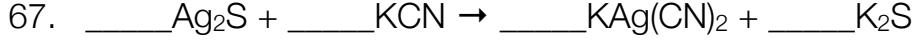
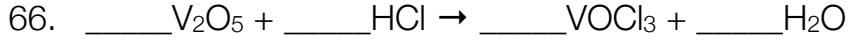
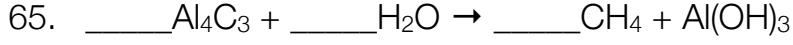
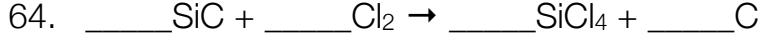
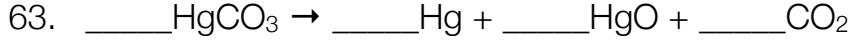
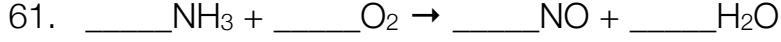
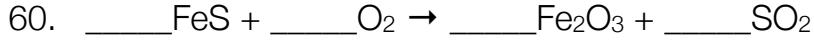
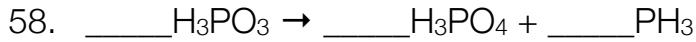
Balance the following equations.







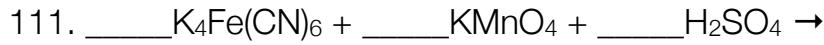
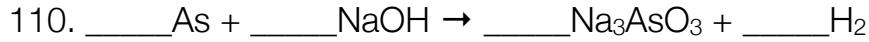
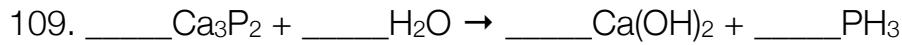
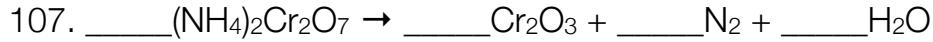
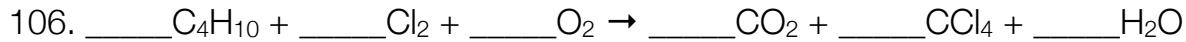
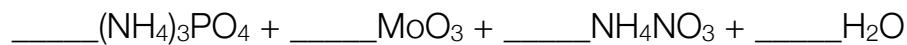
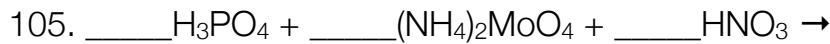
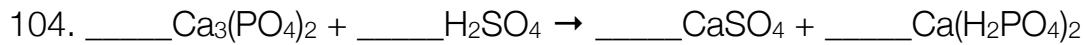
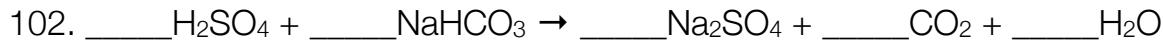
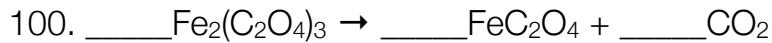
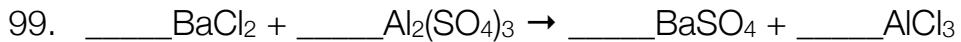
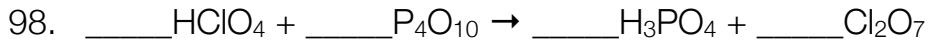
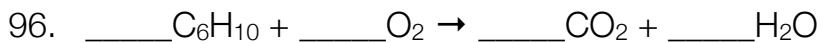
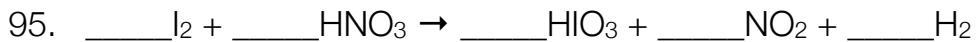
36. $\text{_____Na}_2\text{CO}_3 + \text{_____HCl} \rightarrow \text{_____NaCl} + \text{_____H}_2\text{O} + \text{_____CO}_2$
37. $\text{_____P}_4 + \text{_____O}_2 \rightarrow \text{_____P}_2\text{O}_5$
38. $\text{_____K}_2\text{O} + \text{_____H}_2\text{O} \rightarrow \text{_____KOH}$
39. $\text{_____Al} + \text{_____O}_2 \rightarrow \text{_____Al}_2\text{O}_3$
40. $\text{_____Na}_2\text{O}_2 + \text{_____H}_2\text{O} \rightarrow \text{_____NaOH} + \text{_____O}_2$
41. $\text{_____C} + \text{_____H}_2\text{O} \rightarrow \text{_____CO} + \text{_____H}_2$
42. $\text{_____H}_3\text{AsO}_4 \rightarrow \text{_____As}_2\text{O}_5 + \text{_____H}_2\text{O}$
43. $\text{_____Al}_2(\text{SO}_4)_3 + \text{_____Ca(OH)}_2 \rightarrow \text{_____Al(OH)}_3 + \text{_____CaSO}_4$
44. $\text{_____FeCl}_3 + \text{_____NH}_4\text{OH} \rightarrow \text{_____Fe(OH)}_3 + \text{_____NH}_4\text{Cl}$
45. $\text{_____Ca}_3(\text{PO}_4)_2 + \text{_____SiO}_2 \rightarrow \text{_____P}_4\text{O}_{10} + \text{_____CaSiO}_3$
46. $\text{_____N}_2\text{O}_5 + \text{_____H}_2\text{O} \rightarrow \text{_____HNO}_3$
47. $\text{_____Al} + \text{_____HCl} \rightarrow \text{_____AlCl}_3 + \text{_____H}_2$
48. $\text{_____H}_3\text{BO}_3 \rightarrow \text{_____H}_4\text{B}_6\text{O}_{11} + \text{_____H}_2\text{O}$
49. $\text{_____Mg} + \text{_____N}_2 \rightarrow \text{_____Mg}_3\text{N}_2$
50. $\text{_____NaOH} + \text{_____Cl}_2 \rightarrow \text{_____NaCl} + \text{_____NaClO} + \text{_____H}_2\text{O}$
51. $\text{_____Li}_2\text{O} + \text{_____H}_2\text{O} \rightarrow \text{_____LiOH}$
52. $\text{_____CaC}_2 + \text{_____H}_2\text{O} \rightarrow \text{_____C}_2\text{H}_2 + \text{_____Ca(OH)}_2$
53. $\text{_____Fe(OH)}_3 \rightarrow \text{_____Fe}_2\text{O}_3 + \text{_____H}_2\text{O}$
54. $\text{_____Pb(NO}_3)_2 \rightarrow \text{_____PbO} + \text{_____NO}_2 + \text{_____O}_2$
55. $\text{_____Ba} + \text{_____H}_2\text{O} \rightarrow \text{_____Ba(OH)}_2 + \text{_____H}_2$



Chemistry



76. $\text{_____SrBr}_2 + (\text{NH}_4)_2\text{CO}_3 \rightarrow \text{_____SrCO}_3 + \text{NH}_4\text{Br}$
77. $\text{_____Ca}_3(\text{PO}_4)_2 + \text{_____SiO}_2 + \text{_____C} \rightarrow$
 $\text{_____CaSiO}_3 + \text{_____P}_4 + \text{_____CO}$
78. $\text{_____Hg(OH)}_2 + \text{_____H}_3\text{PO}_4 \rightarrow \text{_____Hg}_3(\text{PO}_4)_2 + \text{_____H}_2\text{O}$
79. $\text{_____I}_4\text{O}_9 \rightarrow \text{_____I}_2\text{O}_6 + \text{_____I}_2 + \text{_____O}_2$
80. $\text{_____C}_2\text{H}_3\text{Cl} + \text{_____O}_2 \rightarrow \text{_____CO}_2 + \text{_____H}_2\text{O} + \text{_____HCl}$
81. $\text{_____}(\text{NH}_4)_2\text{Cr}_2\text{O}_7 \rightarrow \text{_____NH}_3 + \text{_____H}_2\text{O} + \text{_____Cr}_2\text{O}_3 + \text{_____O}_2$
82. $\text{_____Al} + \text{_____NaOH} + \text{_____H}_2\text{O} \rightarrow \text{_____NaAl(OH)}_4 + \text{_____H}_2$
83. $\text{_____NH}_4\text{Cl} + \text{_____Ca(OH)}_2 \rightarrow \text{_____CaCl}_2 + \text{_____NH}_3 + \text{_____H}_2\text{O}$
84. $\text{_____C}_7\text{H}_{10}\text{N} + \text{_____O}_2 \rightarrow \text{_____CO}_2 + \text{_____H}_2\text{O} + \text{_____NO}_2$
85. $\text{_____H}_3\text{PO}_4 + \text{_____HCl} \rightarrow \text{_____PCl}_5 + \text{_____H}_2\text{O}$
86. $\text{_____HCl} + \text{_____K}_2\text{CO}_3 \rightarrow \text{_____KCl} + \text{_____H}_2\text{O} + \text{_____CO}_2$
87. $\text{_____Ca(ClO}_3)_2 \rightarrow \text{_____CaCl}_2 + \text{_____O}_2$
88. $\text{_____C}_2\text{H}_5\text{OH} + \text{_____O}_2 \rightarrow \text{_____CO} + \text{_____H}_2\text{O}$
89. $\text{_____Xe} + \text{_____F}_2 \rightarrow \text{_____XeF}_6$
90. $\text{_____NH}_4\text{NO}_3 \rightarrow \text{_____N}_2\text{O} + \text{_____H}_2\text{O}$
91. $\text{_____Au}_2\text{O}_3 \rightarrow \text{_____Au} + \text{_____O}_2$
92. $\text{_____C}_4\text{H}_{10} + \text{_____O}_2 \rightarrow \text{_____CO}_2 + \text{_____H}_2\text{O}$
93. $\text{_____Fe}_3\text{O}_4 + \text{_____H}_2 \rightarrow \text{_____Fe} + \text{_____H}_2\text{O}$
94. $\text{_____O}_2 \rightarrow \text{_____O}_3$





Practicing Types of Reactions

For the following reactions, write the **word**, **skeleton** and **balanced** chemical equations. Note: “aqueous” means that the chemical is dissolved in a solution.

1. Aluminum and hydrochloric acid react in a single-displacement reaction.

word

skeleton

balanced

2. Ethane burns in oxygen in a complete combustion reaction.

word

skeleton

balanced

3. Magnesium metal burns in oxygen gas in a synthesis reaction.

word

skeleton

balanced

4. Water is formed by a synthesis reaction.

word

skeleton

balanced

5. Sodium iodide reacts with potassium nitrate is a double-displacement reaction.

word

skeleton

balanced

6. When zinc metal and sulfur powder are heated, a synthesis reaction occurs.

word

skeleton

balanced

7. Aluminum metal reacts with hydrogen chloride gas is a single-displacement reaction.

word

skeleton

balanced

8. Zinc oxide is produced by a synthesis reaction.

word

skeleton

balanced

9. Sodium reacts with chlorine in a synthesis reaction.

word

skeleton

balanced

10. Hydrogen gas and oxygen gas react in a synthesis reaction.

word

skeleton

balanced

11. Silver sulfide is produced by a synthesis reaction.

word

skeleton

balanced



12. Iron reacts with the oxygen in the air to form rust in a synthesis reaction.

word

skeleton

balanced

13. Hydrogen gas and a sodium hydroxide solution are formed by a single-displacement reaction.

word

skeleton

balanced

14. When zinc metal is placed in a solution of hydrochloric acid, a single-displacement reaction occurs.

word

skeleton

balanced

15. A sodium chloride solution reacts with a lead (II) nitrate solution in a double-displacement reaction.

word

skeleton

balanced

16. Butane burns in an incomplete combustion reaction.

word

skeleton

balanced

17. Barium hydroxide neutralizes sulfuric acid in a double-displacement reaction.

word

skeleton

balanced

18. Sodium chloride and bromine are produced in a single-displacement reaction.

word

skeleton

balanced

19. Hydrogen gas and nitrogen gas react in a synthesis reaction.

word

skeleton

balanced

20. Calcium phosphate and sodium chloride are produced in a double-displacement reaction.

word

skeleton

balanced

21. Magnesium reacts with nitrogen gas in a synthesis reaction.

word

skeleton

balanced

22. Solid magnesium oxide reacts with hydrochloric acid in a double-displacement reaction.

word

skeleton

balanced

23. Solid zinc metal reacts with sulfuric acid in a double-displacement reaction.

word

skeleton

balanced



24. Solid iron (III) oxide reacts with solid aluminum metal in a single-displacement reaction.

word

skeleton

balanced

25. hydrogen peroxide decomposes leaving water and a gas.

word

skeleton

balanced

26. Methane burns in a complete combustion reaction.

word

skeleton

balanced

27. A single-displacement reaction forms copper (II) nitrate and silver.

word

skeleton

balanced

28. Iron (III) hydroxide decomposes, producing water as one of the products.

word

skeleton

balanced

29. Gold (III) oxide decomposes.

word

skeleton

balanced

Solutions

| Practicing Types of Reactions | |
|---|--|
| 1. aluminum + hydrochloric acid → hydrogen + aluminum chloride | hydrogen + aluminum chloride + water |
| 2. $\text{Al} + \text{HCl} \rightarrow \text{H}_2 + \text{AlCl}_3$ | hydrogen + oxygen → water |
| 3. $\text{MgO} + \text{O}_2 \rightarrow \text{MgO}_2 + \text{H}_2\text{O}$ | magnesium + oxygen → magnesium oxide |
| 4. $\text{Mg} + \text{O}_2 \rightarrow \text{MgO}_2$ | hydrogen + oxygen → water |
| 5. $\text{Na} + \text{KNO}_3 \rightarrow \text{K} + \text{NaNO}_3$ | sodium iodide + potassium nitrate → potassium iodide + sodium nitrate |
| 6. $\text{Zn} + \text{S} \rightarrow \text{ZnS}$ | zinc + sulfur → zinc sulfide |
| 7. $\text{Zn} + \text{O}_2 \rightarrow \text{ZnO}$ | zinc + oxygen → zinc oxide |
| 8. $\text{Zn} + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{ZnO}$ | zinc + water → hydrogen + zinc oxide |
| 9. $\text{Na} + \text{Cl}_2 \rightarrow \text{NaCl}$ | sodium + chlorine → sodium chloride |
| 10. $\text{Zn} + \text{O}_2 \rightarrow \text{ZnO}$ | hydrogen + oxygen → water |
| 11. $\text{Zn} + \text{Cl}_2 \rightarrow \text{ZnCl}_2$ | silver sulfide + chlorine → silver chloride |
| 12. $\text{Fe} + \text{O}_2 \rightarrow \text{FeO}_2$ | iron + oxygen → iron (III) oxide |
| 13. $\text{Na} + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{NaOH}$ | sodium + water → hydrogen + sodium hydroxide |
| 14. $\text{Zn} + 2\text{HCl} \rightarrow \text{H}_2 + \text{ZnCl}_2$ | zinc + hydrochloric acid → hydrogen + zinc chloride |
| 15. $\text{NaCl} + \text{Pb(NO}_3)_2 \rightarrow \text{PbCl}_2 + 2\text{NaNO}_3$ | sodium chloride + lead (II) nitrate → lead (II) chloride + sodium nitrate |
| 16. $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ | methane + oxygen → carbon dioxide + water |
| 17. $\text{Ba(OH)}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{H}_2\text{O} + \text{BaSO}_4$ | barium hydroxide + sulfuric acid → water + barium sulfate |
| 18. $\text{Ba(OH)}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{H}_2\text{O} + \text{BaSO}_4$ | barium hydroxide + sulfuric acid → water + barium sulfate |
| 19. $\text{NH}_3 + \text{Cl}_2 \rightarrow \text{N}_2 + \text{NH}_4\text{Cl}$ | hydrogen + chlorine → ammonia |
| 20. $\text{Na} + \text{KPO}_4 \rightarrow \text{K} + \text{NaPO}_4$ | sodium iodide + potassium phosphate → potassium iodide + sodium phosphate |
| 21. $\text{Mg} + \text{N}_2 \rightarrow \text{Mg}_3\text{N}_2$ | magnesium + nitrogen → magnesium nitride |
| 22. $\text{MgO} + \text{HCl} \rightarrow \text{H}_2\text{O} + \text{MgCl}_2$ | magnesium oxide + hydrochloric acid → water + magnesium chloride |
| 23. $\text{Zn} + \text{H}_2\text{SO}_4 \rightarrow \text{H}_2 + \text{ZnSO}_4$ | zinc + sulfuric acid → hydrogen + zinc sulfate |
| 24. $\text{Zn} + \text{Al}_2\text{O}_3 \rightarrow \text{Al} + \text{ZnO}$ | iron (III) oxide + aluminum → aluminum oxide + iron |
| 25. $\text{H}_2\text{O}_2 \rightarrow \text{H}_2\text{O} + \text{O}_2$ | hydrogen peroxide → water + oxygen |
| 26. $\text{ZnO}_2 \rightarrow \text{Zn} + \text{O}_2$ | methane + oxygen → carbon dioxide + water |
| 27. $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ | silver nitrate + copper → copper (II) nitrate + silver |
| 28. $\text{Fe(OH)}_3 \rightarrow \text{H}_2\text{O} + \text{Fe}_2\text{O}_3$ | iron (III) hydroxide → water + iron (III) oxide |
| 29. $\text{Au}_2\text{O}_3 \rightarrow \text{Au} + \text{O}_2$ | gold (III) oxide → gold + oxygen |
| 30. $\text{2AgNO}_3 + \text{Cu} \rightarrow \text{Cu}(\text{NO}_3)_2 + \text{Ag}$ | silver nitrate + copper → copper (II) nitrate + silver |
| 31. $\text{2Na} + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{NaOH}$ | sodium + water → hydrogen + sodium hydroxide |
| 32. $\text{Zn} + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{ZnO}$ | zinc + water → hydrogen + zinc oxide |
| 33. $\text{Ca(OH)}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{CaO}$ | calcium hydroxide + water → calcium oxide + hydrogen |
| 34. $\text{Ca(OH)}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{CaO}$ | calcium hydroxide + water → calcium oxide + hydrogen |
| 35. $\text{Ca(OH)}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{CaO}$ | calcium hydroxide + water → calcium oxide + hydrogen |
| 36. $\text{Ca(OH)}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{CaO}$ | calcium hydroxide + water → calcium oxide + hydrogen |
| 37. $\text{Ca(OH)}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{CaO}$ | calcium hydroxide + water → calcium oxide + hydrogen |
| 38. $\text{Ca(OH)}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{CaO}$ | calcium hydroxide + water → calcium oxide + hydrogen |
| 39. $\text{Ca(OH)}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{CaO}$ | calcium hydroxide + water → calcium oxide + hydrogen |
| 40. $\text{Ca(OH)}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{CaO}$ | calcium hydroxide + water → calcium oxide + hydrogen |
| 41. $\text{Ca(OH)}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{CaO}$ | calcium hydroxide + water → calcium oxide + hydrogen |
| 42. $\text{Ca(OH)}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{CaO}$ | calcium hydroxide + water → calcium oxide + hydrogen |
| 43. $\text{Ca(OH)}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{CaO}$ | calcium hydroxide + water → calcium oxide + hydrogen |
| 44. $\text{Ca(OH)}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2 + \text{CaO}$ | calcium hydroxide + water → calcium oxide + hydrogen |
| 45. $\text{LiOH} + \text{H}_2\text{O} \rightarrow \text{LiOH}$ | lithium hydroxide + water → lithium hydroxide |
| 46. $\text{CaCO}_3 + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{CO}_2$ | calcium carbonate + water → calcium hydroxide + carbon dioxide |
| 47. $\text{SiBr}_4 + (\text{NH}_4)_2\text{CO}_3 \rightarrow \text{SiCO}_3 + \text{NH}_4\text{Br}$ | silicon tetrabromide + ammonium carbonate → silicon trioxide + ammonium bromide |
| 48. $\text{Si(OH)}_4 + \text{Ca(OH)}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}$ | silanol + calcium hydroxide → calcium carbonate + water |
| 49. $\text{3Mg} + \text{N}_2 \rightarrow \text{Mg}_3\text{N}_2$ | magnesium + nitrogen → magnesium nitride |
| 50. $\text{2NaOH} + \text{Cl}_2 \rightarrow \text{NaCl} + \text{NaClO} + \text{H}_2\text{O}$ | sodium hydroxide + chlorine → sodium chloride + sodium hypochlorite + water |
| 51. $\text{LiBr} + \text{H}_2\text{O} \rightarrow \text{LiOH} + \text{H}_2\text{O}$ | lithium bromide + water → lithium hydroxide + water |
| 52. $\text{CaCO}_3 + 2\text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \text{CO}_2$ | calcium carbonate + water → calcium hydroxide + carbon dioxide |
| 53. $2\text{Fe(OH)}_3 \rightarrow \text{Fe}_2\text{O}_3 + 3\text{H}_2\text{O}$ | iron (III) hydroxide → iron (III) oxide + water |
| 54. $2\text{Pb(BNO}_3)_2 \rightarrow 2\text{PbO} + \text{4NO}_2 + \text{H}_2\text{O}$ | lead (II) nitrate → lead oxide + nitrogen dioxide + water |
| 55. $\text{Ba} + 2\text{H}_2\text{O} \rightarrow \text{Ba(OH)}_2 + \text{H}_2$ | boron + water → barium hydroxide + hydrogen |
| 56. $4\text{NH}_3 + 6\text{NO} \rightarrow \text{N}_2 + \text{H}_2\text{O}$ | ammonia + nitrogen dioxide → nitrogen + water |
| 57. $4\text{NH}_3 + 2\text{AlCl}_3 \rightarrow 3\text{CaCl}_2 + 2\text{Al}$ | ammonia + aluminum chloride → calcium chloride + aluminum |
| 58. $4\text{H}_3\text{PO}_4 \rightarrow 3\text{H}_2\text{O} + \text{H}_2\text{O}$ | phosphoric acid → water + water |
| 59. $\text{Fe}_2\text{O}_3 + 3\text{C} \rightarrow \text{3CO} + 2\text{Fe}$ | iron (III) oxide + carbon → carbon dioxide + iron |
| 60. $4\text{FeS} + 7\text{O}_2 \rightarrow 4\text{NO}_2 + \text{H}_2\text{O}$ | iron sulfide + oxygen → nitrogen dioxide + water |
| 61. $4\text{NH}_3 + 5\text{O}_2 \rightarrow 4\text{NO}_2 + \text{H}_2\text{O}$ | ammonia + oxygen → nitrogen dioxide + water |
| 62. $4\text{Si} + \text{S}_8 \rightarrow 2\text{Si}_2\text{S}_4$ | silicon + sulfur → disilane |
| 63. $\text{HgOOC} + \text{CO}_2 \rightarrow \text{Hg} + \text{H}_2\text{O}$ | mercury(II) acetate + carbon dioxide → mercury + water |
| 64. $\text{SiCl} + 2\text{C}_2 \rightarrow \text{SiCl}_4 + \text{C}$ | silicon + carbon → tetrachlorosilane + carbon |
| 65. $\text{2V}_2\text{O}_5 + 12\text{H}_2\text{O} \rightarrow 3\text{H}_4\text{V}_4\text{O}_9 + 4\text{Al(OH)}_3$ | vanadium pentoxide + water → vanadyl(IV) oxide + aluminum hydroxide |
| 66. $\text{V}_2\text{O}_5 + 6\text{HCl} \rightarrow 2\text{VOCl}_3 + 3\text{H}_2\text{O}$ | vanadium pentoxide + hydrochloric acid → vanadyl chloride + water |
| 67. $\text{Ag}_2\text{S} + 4\text{C}_2\text{N} \rightarrow 2\text{KAg(C}_2\text{N})_2 + \text{K}_2\text{S}$ | silver sulfide + carbon tetracyanide → potassium cyanide + potassium sulfide |
| 68. $\text{Au}_2\text{S}_3 + 3\text{H}_2 \rightarrow 2\text{Au} + 3\text{H}_2\text{S}$ | gold sulfide + hydrogen → gold + hydrogen sulfide |
| 69. $2\text{DIO}_3 + \text{3H}_2 \rightarrow \text{2Au} + \text{HClO}_3$ | dioxygen + hydrogen → gold + chloric acid |
| 70. $4\text{KO}_2 + 2\text{CO}_2 \rightarrow 2\text{K}_2\text{CO}_3 + 3\text{O}_2$ | potassium superoxide + carbon dioxide → potassium carbonate + oxygen |
| 71. $2\text{MgNH}_2\text{PO}_4 \rightarrow 2\text{Mg} + \text{P}_2\text{O}_7 + 2\text{NH}_3 + \text{H}_2\text{O}$ | magnesium dihydride + phosphorus(V) oxide → magnesium + phosphorus(V) pentoxide + water |
| 72. $\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + \text{H}_2\text{O} + \text{Cl}_2$ | manganese dioxide + hydrochloric acid → manganese chloride + water + chlorine |
| 73. $\text{Pb} + 4\text{Na} + 4\text{C}_2\text{H}_5\text{Cl} \rightarrow \text{Pb(C}_2\text{H}_5)_4 + 4\text{NaCl}$ | lead + sodium + ethyl chloride → lead(IV) ethyl + sodium chloride |
| 74. $\text{Ca(OH)}_2 + \text{H}_2\text{O} \rightarrow \text{CaO} + \text{H}_2\text{O}$ | calcium hydroxide + water → calcium oxide + water |
| 75. $\text{Zn} + 2\text{NaOH} + \text{H}_2\text{O} \rightarrow \text{Na}_2\text{Zn(OH)}_4 + \text{H}_2$ | zinc + sodium hydroxide + water → sodium zincate + water |
| 76. $\text{SiBr}_4 + (\text{NH}_4)_2\text{CO}_3 \rightarrow \text{SiCO}_3 + \text{NH}_4\text{Br}$ | silicon tetrabromide + ammonium carbonate → silicon trioxide + ammonium bromide |
| 77. $2\text{Ca}_3\text{P}_2\text{O}_10 + \text{H}_2\text{O} \rightarrow 3\text{Ca}_2\text{P}_2\text{O}_7 + \text{P}_4 + \text{CO}_2$ | calcium triphosphate + water → calcium pyrophosphate + phosphorus + carbon dioxide |
| 78. $3\text{Hg(OH)}_2 + 2\text{H}_2\text{O} \rightarrow \text{Hg}_3\text{PO}_4 + \text{H}_2\text{O}$ | mercury(II) hydroxide + water → mercury(IV) phosphate + water |
| 79. $18\text{Al}_2\text{O}_3 + 9\text{Li}_2\text{O} + 7\text{Be} + 3\text{O}_2 \rightarrow 10\text{Al}_2\text{O}_5 + 7\text{Li}_2\text{O} + 15\text{O}_2$ | aluminum oxide + lithium oxide + beryllium oxide + oxygen → alumina + lithium oxide + beryllium oxide + oxygen |
| 80. $2\text{Fe}_3\text{O}_4 + \text{HCl} \rightarrow \text{FeCl}_3 + \text{2H}_2\text{O}$ | iron (III) oxide + hydrochloric acid → ferric chloride + water |
| 81. $2\text{NH}_3 + 5\text{O}_2 \rightarrow \text{ANH}_3 + 2\text{H}_2\text{O} + \text{2CO}_2 + \text{4H}_2\text{O}$ | ammonia + oxygen → aniline + water + carbon dioxide + water |
| 82. $2\text{Al} + \text{NaOH} + \text{H}_2\text{O} \rightarrow \text{NaAl(OH)}_4 + 3\text{H}_2\text{O}$ | aluminum + sodium hydroxide + water → sodium aluminate + water |
| 83. $2\text{Ca}_3\text{H}_2\text{O}_3 + \text{Ca(OH)}_2 \rightarrow \text{CaCO}_3 + \text{CO}_2 + 2\text{H}_2\text{O}$ | calcium trihydroxide + calcium hydroxide → calcium carbonate + carbon dioxide + water |
| 84. $2\text{C}_2\text{H}_5\text{OH} + 2\text{O}_2 \rightarrow 2\text{CO}_2 + \text{2H}_2\text{O}$ | ethanol + oxygen → carbon dioxide + water |
| 85. $2\text{H}_2\text{O} + \text{O}_2 \rightarrow \text{2H}_2 + \text{O}_2$ | water + oxygen → hydrogen + oxygen |
| 86. $2\text{KCl} + \text{K}_2\text{CO}_3 \rightarrow 2\text{K}_2\text{O} + \text{CO}_2 + \text{2H}_2\text{O}$ | potassium chloride + potassium carbonate → potassium oxide + carbon dioxide + water |
| 87. $2\text{CaCl}_2 + \text{H}_2\text{O} \rightarrow \text{CaO} + \text{H}_2\text{O} + \text{3O}_2$ | calcium chloride + water → calcium oxide + water + oxygen |
| 88. $2\text{Ca}_3\text{H}_2\text{O}_3 + \text{2O}_2 \rightarrow 2\text{CO} + 3\text{H}_2\text{O}$ | calcium trihydroxide + oxygen → carbon monoxide + water |
| 89. $2\text{Xe} + 3\text{F}_2 \rightarrow \text{XeF}_6$ | xenon + fluorine → xenon hexafluoride |
| 90. $\text{NH}_3\text{NO}_3 \rightarrow \text{N}_2\text{O} + 2\text{H}_2\text{O}$ | ammonia + nitro → dinitrogen + water |
| 91. $2\text{Al}_2\text{O}_3 \rightarrow 4\text{Al} + 3\text{O}_2$ | aluminum oxide → aluminum + oxygen |
| 92. $2\text{C}_2\text{H}_5\text{O}_3 \rightarrow 4\text{AU} + 2\text{H}_2\text{O}$ | ethanol → aluminum + water |
| 93. $\text{Fe}_3\text{O}_4 + 4\text{H}_2 \rightarrow \text{3Fe} + 4\text{H}_2\text{O}$ | iron (III) oxide + hydrogen → iron + water |
| 94. $3\text{O}_2 \rightarrow 2\text{O}_3$ | oxygen → ozone |
| 95. $\text{C}_2\text{H}_6\text{O} + 15\text{O}_2 \rightarrow 12\text{CO}_2 + \text{2H}_2\text{O}$ | ethane + oxygen → carbon dioxide + water |
| 96. $\text{C}_2\text{H}_6\text{O} + \text{H}_2\text{O} \rightarrow \text{2H}_2\text{O} + \text{CO}_2 + \text{CO} + \text{C}$ | ethane + water → carbon dioxide + carbon + carbon monoxide + water |
| 97. $\text{C}_2\text{H}_6\text{O} + 4\text{O}_2 \rightarrow 5\text{H}_2\text{O} + \text{CO}_2 + \text{CO} + \text{C}$ | ethane + oxygen → carbon dioxide + carbon + carbon monoxide + water |
| 98. $\text{C}_2\text{H}_6\text{O} + 4\text{O}_2 \rightarrow 5\text{H}_2\text{O} + \text{CO}_2 + \text{CO} + \text{C}$ | ethane + oxygen → carbon dioxide + carbon + carbon monoxide + water |
| 99. $\text{3B}_2\text{AlCl}_2 + \text{Al}_2\text{O}_3 \rightarrow 2\text{B}_3\text{Al}_2\text{O}_5 + \text{3AlCl}_3$ | aluminum chloride + aluminum oxide → boron trioxide + aluminum chloride |
| 100. $\text{Fe}_2\text{O}_3 + \text{Al}_2\text{O}_3 \rightarrow 2\text{Fe}_3\text{O}_4 + 2\text{Al}_2\text{O}_5$ | iron (III) oxide + aluminum oxide → magnetite + aluminum oxide |
| 101. $\text{3Al} + \text{N}_2 \rightarrow \text{Al}_2\text{O}_3 + \text{N}_2 + 4\text{H}_2\text{O}$ | aluminum + nitrogen → aluminum oxide + nitrogen + water |
| 102. $\text{H}_2\text{SO}_4 + \text{NaHCO}_3 \rightarrow \text{Na}_2\text{SO}_4 + \text{CO}_2 + \text{H}_2\text{O}$ | hydrogen sulfate + sodium bicarbonate → sodium sulfate + carbon dioxide + water |
| 103. $\text{Ca(H}_2\text{PO}_4)_2 + \text{H}_2\text{O} \rightarrow \text{3Ca}_2\text{O}_4 + \text{2H}_2\text{O}$ | calcium dihydrogen phosphate + water → calcium oxide + water |
| 104. $\text{Ca}_3\text{P}_2\text{O}_10 + 2\text{H}_2\text{O} \rightarrow \text{2Ca}_2\text{O}_4 + \text{2H}_2\text{O}$ | calcium triphosphate + water → calcium oxide + water |
| 105. $\text{Ca}_3\text{P}_2\text{O}_10 + 2\text{H}_2\text{O} \rightarrow \text{2Ca}_2\text{O}_4 + \text{2H}_2\text{O}$ | calcium triphosphate + water → calcium oxide + water |
| 106. $2\text{C}_2\text{H}_5\text{OH} + 4\text{C}_2\text{H}_5 + 10\text{O}_2 \rightarrow 11\text{O}_2 + 6\text{CO}_2 + 2\text{CO}_1 + \text{H}_2\text{O}$ | ethanol + carbon + oxygen → carbon dioxide + water |
| 107. $\text{Ni}(\text{H}_2\text{PO}_4)_2 \rightarrow \text{Cr}_2\text{O}_3 + \text{N}_2 + 4\text{H}_2\text{O}$ | nickel(II) dihydrogen phosphate → chromium(III) oxide + nitrogen + water |
| 108. $\text{SiBr}_4 + (\text{NH}_4)_2\text{CO}_3 \rightarrow \text{SiCO}_3 + \text{NH}_4\text{Br}$ | silicon tetrabromide + ammonium carbonate → silicon trioxide + ammonium bromide |
| 109. $\text{SiBr}_4 + (\text{NH}_4)_2\text{CO}_3 \rightarrow \text{SiCO}_3 + \text{NH}_4\text{Br}$ | silicon tetrabromide + ammonium carbonate → silicon trioxide + ammonium bromide |
| 110. $\text{2Al}_2\text{O}_3 + \text{3H}_2 \rightarrow \text{4Al} + 3\text{O}_2$ | aluminum oxide + hydrogen → aluminum + oxygen |
| 111. $10\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 3\text{Fe}_2\text{O}_3 + 12\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 112. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 113. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 114. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 115. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 116. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 117. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 118. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 119. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 120. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 121. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 122. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 123. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 124. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 125. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 126. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 127. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 128. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 129. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 130. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 131. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 132. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 133. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 134. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 135. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 136. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 137. $16\text{K}_2\text{FeO}_4 + \text{H}_2\text{O} \rightarrow 4\text{Fe}_2\text{O}_3 + 16\text{KAl(OH)}_4 + 1\text{H}_2\text{O}$ | potassium ferrate + water → iron (III) oxide + potassium aluminate + water |
| 138. 1 | |

Solutions