1. Lithium carbonate reacts with hydrochloric acid (HCl) to produce water, carbon dioxide and lithium chloride.

\[ \text{Li}_2\text{CO}_3 + 2\text{HCl} \rightarrow \text{H}_2\text{O} + \text{CO}_2 + 2\text{LiCl} \]

2. Sodium sulfide will react with magnesium iodide to produce sodium iodide and magnesium sulfide.

\[ \text{Na}_2\text{S} + \text{MgI}_2 \rightarrow 2\text{NaI} + \text{MgS} \]

3. Ethanol (CH\(_2\)CH\(_2\)OH or C\(_2\)H\(_5\)OH) will burn in oxygen to produce water and carbon dioxide.

\[ \text{C}_2\text{H}_5\text{OH} + 3\text{O}_2 \rightarrow 3\text{H}_2\text{O} + 2\text{CO}_2 \]

4. Hydrogen and oxygen can be burned, under certain conditions, to form hydrogen peroxide (officially called dihydrogen dioxide).

\[ \text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}_2 \]

5. Calcium chloride can react with water to produce hydrogen chloride and calcium oxide.

\[ \text{CaCl}_2 + \text{H}_2\text{O} \rightarrow 2\text{HCl(g)} + \text{CaO} \]

6. Aluminum nitrate can react with potassium fluoride to produce potassium nitrate and aluminum fluoride.

\[ \text{Al(NO}_3\text{)}_3 + 3\text{KF} \rightarrow 3\text{KNO}_3 + \text{AlF}_3 \]

7. Silicon and oxygen can react to form disiliconhexoxide.

\[ 2\text{Si} + 3\text{O}_2 \rightarrow \text{Si}_2\text{O}_6 \]

8. Ammonium chloride will react with calcium hydroxide to form calcium chloride and ammonium hydroxide.

\[ 2\text{NH}_4\text{Cl (s)} + \text{Ca(OH)}_2 \rightarrow \text{CaCl}_2 + 2\text{NH}_3\text{OH} \]

9. Iron(II) bromide can react with water to produce iron(III)oxide and hydrogen bromide.

\[ \text{FeBr}_2 + \text{H}_2\text{O} \rightarrow \text{Fe}_2\text{O}_3 + 2\text{HBr} \]

10. Silver metal can react with hydrochloric acid (HCl) to form silver chloride and hydrogen gas.

\[ 2\text{Ag(s)} + 2\text{HCl} \rightarrow 2\text{AgCl} + \text{H}_2 \]
Balancing Symbolic Equations

While balancing equations, take into consideration the following:

1. Never change the formula and the subscripts in a formula.
2. Remember the seven diatomic molecules are always written as H₂, N₂, O₂, F₂, Cl₂, Br₂, I₂. Balance the atoms on either side of the equation by changing the coefficients.
3. Make sure the coefficients are the smallest set of a whole number.

Now try balancing these equations:

1. \( \text{2Cu} + \text{O}_2 \rightarrow \text{2CuO} \)

2. \( \text{S}_8 + \text{2F}_2 \rightarrow \text{SF}_6 \)

3. \( \text{P}_4\text{O}_{10} + \text{6H}_2\text{O} \rightarrow \text{4H}_3\text{PO}_4 \)

4. \( \text{ZnS} + \text{2HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2\text{S} \)

5. \( \text{C}_5\text{H}_12 + \text{8O}_2 \rightarrow \text{5CO}_2 + \text{6H}_2\text{O} \)

6. \( \text{C}_2\text{H}_5\text{OH} + \text{3O}_2 \rightarrow \text{2CO}_2 + \text{3H}_2\text{O} \)

7. \( \text{2NH}_3 + \text{O}_2 \rightarrow \text{2NO} + \text{3H}_2 \)

8. \( \text{Fe}_2\text{S}_3 + \frac{9}{2}\text{O}_2 \rightarrow \text{Fe}_2\text{O}_3 + \text{3SO}_2 \) \( \text{6Fe}_2\text{S}_3 + 9\text{O}_2 \rightarrow \text{2Fe}_2\text{O}_3 + 6\text{SO}_2 \)

9. \( \text{2C}_6\text{H}_6 + \text{15O}_2 \rightarrow \text{12CO}_2 + 6\text{H}_2\text{O} \) \( \text{2Fe}_2\text{O}_3 + 6\text{SO}_2 \)

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