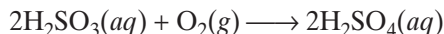
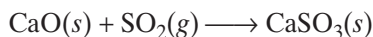


In air polluted with SO_2 , sulfurous acid further reacts with oxygen to form sulfuric acid, one of the main ingredients in *acid rain*.



Certain metal oxides and nonmetal oxides react with each other in synthesis reactions to form salts. For example, calcium sulfite is formed by the reaction of calcium oxide and sulfur dioxide.



Decomposition Reactions

In a **decomposition reaction**, a single compound undergoes a reaction that produces two or more simpler substances. Decomposition reactions are the opposite of synthesis reactions and are represented by the following general equation.

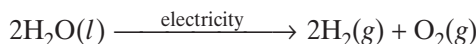


AX is a compound. A and X can be elements or compounds.

Most decomposition reactions take place only when energy in the form of electricity or heat is added. Examples of several types of decomposition reactions are given in the following sections.

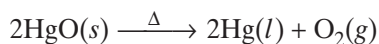
Decomposition of Binary Compounds

The simplest kind of decomposition reaction is the decomposition of a binary compound into its elements. We have already examined one example of a decomposition reaction. **Figure 5** on page 270 shows that passing an electric current through water will decompose the water into its constituent elements, hydrogen and oxygen.



*The decomposition of a substance by an electric current is called **electrolysis**.*

Oxides of the less-active metals, which are located in the lower center of the periodic table, decompose into their elements when heated. Joseph Priestley discovered oxygen through such a decomposition reaction in 1774, when he heated mercury(II) oxide to produce mercury and oxygen.



This reaction is shown in **Figure 10** on the following page.