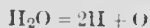


Many substances will burn in chlorine, as we shall see; hence, we cannot say that mere supporting of combustion proves the presence of oxygen. The products of burning in chlorine are not oxides, or like them.

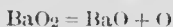
The fact that combustible substances burn much more energetically in pure oxygen than in air is easily understood when it is remembered that there is only one-fifth oxygen. Not only is it harder for the substance to find the oxygen as fast as it wants it, but the inert four-fifths of the air carry off a great deal of the heat produced and thus keep the temperature from getting very high. However, the *total* amount of heat produced when a certain quantity of any substance burns is always the same, whether it burn fast and produce a high temperature, or slowly and only a low temperature is attained on account of the dissipation of the heat.

Certain methods of producing oxygen, other than those mentioned above, are often used on the commercial scale. These may be summarized as follows:

Decomposition of acidulated water by electric current (electrolysis)



Heating of barium dioxide (Brin's process)



Intense heating of manganese dioxide



The slow evaporation of liquid air, most of the nitrogen and only a little oxygen going off during the first part of the evaporation, leaving most of the oxygen and only a little of the nitrogen.

(In the leaves of green plants, under the influence of sunlight, CO_2 is decomposed, its oxygen being returned to the air, as we shall see when speaking of starch.)

Ozone.—When electric sparks are passed through air or oxygen, something with a peculiar odor is formed. The same substance may be obtained as follows: In a glass jar, or wide-mouthed bottle, place a clean piece of phosphorus about the size of a marble and partly cover it with water. (Cut the phosphorus under water and lift it with forceps, not with the fingers.) Place a piece of paper or card over the mouth of the jar. After some minutes the gas in the jar will be found to have a peculiar odor, and paper saturated with a solution of starch and potassium iodide will be quickly turned blue if placed in the jar. The substance produced in this way is called ozone; it is a gas, colorless, with a strong odor, and it has been shown that it is a peculiar form of oxygen, more dense than the ordinary form.