

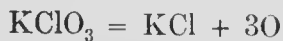
In the air, the oxygen is in the free state, *i.e.*, uncombined; in water, in the solid crust of the earth, and in animal and vegetable substances it is in combination with other elements.

Preparation.—To Priestley belongs not only the credit of the discovery of this gas and a number of others, but also the working out of a method for collecting gases free from air and other impurities, and thus enabling them to be studied with much greater accuracy than formerly, when they were generally collected in bladders, if collected at all. He used a tub, or other vessel capable of holding water, provided with a shelf pierced with holes and placed below the surface of the water. This arrangement is known as a pneumatic trough. By filling bottles or other vessels with water in the trough and then inverting them under the water and standing them on the shelf, over the holes, they may be very easily filled with gases by bringing under them the end of the tube delivering the gas, when this latter will bubble up through the water into the bottle without any air getting in. This is known as collecting gases over the pneumatic trough. (Sometimes mercury is used instead of water in the trough, which is then made small.)

As has already been pointed out, oxygen was first prepared pure by heating mercuric oxide (red precipitate).



This method is not generally used in the laboratory, because it is expensive and inconvenient. There are many other compounds which yield oxygen on heating, and the best of these is potassium chlorate.



* The meaning of these equations will be clear after studying Chap. VIII. They are introduced here because they will be of great value when reviewing.