

In the experiments just described, the hydrogen gets its necessary oxygen slowly ; if, however, we mix the hydrogen with oxygen (or air) first and then ignite, the combustion takes place so exceedingly rapidly that an explosion is the result.

EXPERIMENT.—Fill a strong glass cylinder two-thirds full of hydrogen and then pass in one-third of oxygen (or, use one volume of hydrogen to two volumes of air). Roll a towel round the cylinder (in case it should break) and then bring a light to the open end.

There are two principal kinds of explosions—those produced by the ignition of an intimate mixture of a combustible and a supporter of combustion (hydrogen and air, coal dust and air, flour and air, gunpowder) and those produced by the very sudden decomposition of certain compounds, such as nitro-glycerine. In both cases, large quantities of gases at high temperatures, and therefore enormously expanded, are produced.

If a flame of burning hydrogen be supplied with pure oxygen, as in the oxy-hydrogen blowpipe (see figure), a very high temperature is produced: the flame will melt platinum.

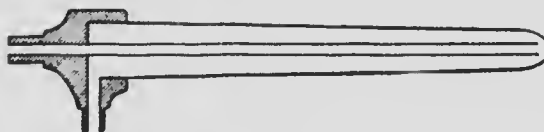


FIG. 8.

If such a flame be directed against a piece of quick-lime, which is infusible, the lime is so highly heated that it gives out a powerful white light. This is known as the lime-light (calcium light, Drummond light), and was formerly much used in theatres, in magic lanterns, etc. It has been almost altogether superseded by the arc light.

The last two experiments show that hydrogen at a high temperature combines eagerly with oxygen. Indeed, under such conditions, its affinity for oxygen is so great that it can extract it from many of its compounds. This reaction is known as reduction.

Reduction is the art of extracting oxygen from a compound that contains it, and the substance that is capable of doing this is called a **Reducing Agent**.