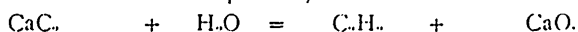


with a current of 4,000 to 5,000 ampères. The equation which represents the action of water on this product, is as follows :—



Calcium carbide + water = acetylene + calcium oxide.

Calcium carbide (CaC_2) is a dark gray, very brittle, porous-looking substance with a Sp. gr. of 2.22 at 18 degrees Centigrade. It contains 62.5 per cent. of calcium and 37.5 per cent. of carbon. On being brought into contact with water, as above stated, a double decomposition takes place, the calcium of the "carbide" combining with the oxygen of the water to form calcium oxide, or, to speak more correctly, owing to excess of water present, slaked lime; the carbon at the same time uniting with the hydrogen of the water to form Acetylene (C_2H_2), which is readily recognized by its penetrating odour, closely resembling garlic.

Acetylene is a colourless gas having a Specific gravity of 0.91 at normal temperature and pressure: 1.1 volumes of the gas are soluble in one volume of water. The gas when inhaled possesses the same poisonous properties as carbon monoxide, but to a greater extent. Prof. Vivian B. Lewes, of London, England, in a paper read before the Society of Arts, says that, "owing to the intense richness of Acetylene, it can only be consumed in small, flat flame burners, but under these conditions emits a light greater than that given by any other known gas: its illuminating value, calculated to a consumption of 5 cubic feet an hour, being no less than 24 $\frac{1}{2}$ candles."

It may be liquified (according to Andsell) at a pressure of 21.5 atmospheres at zero centigrade. This property suggested to some the probable use of liquid Acetylene for portable lamps, lighting of railway carriages, etc., since thus a large volume of the gas can be stored in a very small space. It has, however, been pointed out that a sudden shock to the liquid or compressed gas frequently causes decomposition with violence. Hence, this use of Acetylene would probably be attended with danger. The carbide of calcium might be used for the purposes just referred to without any such risk, and consequently has been proposed as a convenient and cheap form to be used where liquid Acetylene would be desirable on the grounds of portability. Specially designed