AN AUTOMATIC GAS-GENERATOR.

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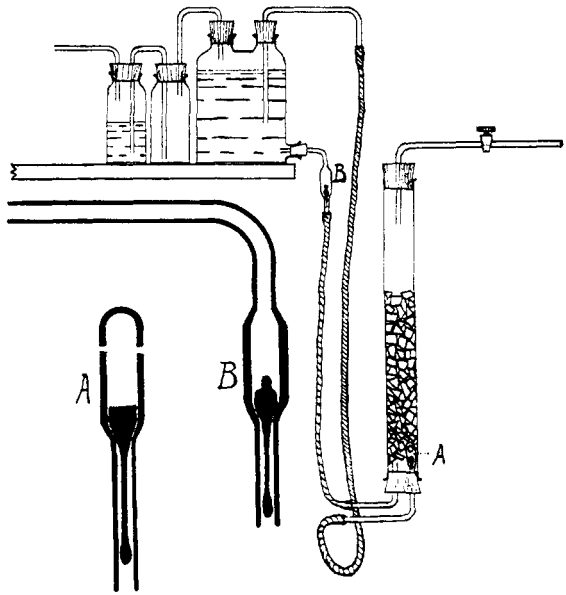
In the course of some experimental work recently begun the writer was confronted with the want of an automatic gas-generator which would yield at least a moderately steady supply of hydrogen sulphide without the necessity of frequent manipulation. As is well known, the Kipp and other forms of gas-generators in common use have the defect of using over and over the spent acid



and salt solution which, because of its greater density, always settles to the bottom of the apparatus. In order to use the whole of the acid it is consequently necessary to agitate the liquid from time to time. To the writer's knowledge there is but one form of automatic generator on the American market in which this necessity is obviated, and that is somewhat complicated.

With a somewhat limited supply of apparatus at hand, the following arrangement was devised which proved so satisfactory and practicable, and withal so simple of construction, that it seemed worth while to publish a description of it. In this description the dimensions are omitted, as it will readily be seen that the sizes of

the different parts will depend largely upon the gas to be prepared and the quantities in demand. The accompanying sketch will serve to show the general proportions of the apparatus in use in this laboratory.

A two-necked Woulff bottle, tubulated at the bottom, was used as an acid tank. The iron sulphide was contained in a glass tube, closed at its upper end with a one-hole rubber stopper fitted with a glass stop-cock, and at its lower end with a two-hole rubber stopper containing inlet and outlet tubes. The inlet tube terminates in a valve, *A*, opening upward just above the stopper, and is connected by rubber tubing to a glass tube passing through one neck of the acid bottle and terminating somewhat below the shoulder of the bottle. The outlet tube is open, and is connected by rubber tubing with another valve-tube, *B*, opening into the acid bottle through the tubulature at the bottom. The rubber tubes and the Woulff bottle being filled with dilute acid and the latter being placed at a suitable height above the generator, on opening the stop-cock, the acid enters the generator and the flow of gas commences at once. On closing the cock, the back pressure forces the acid from the generator back to the bottom of the acid bottle, and subsequent reopening allows the ingress of fresh acid into the generator. The second neck of the Woulff bottle was in this case connected with a trap for the absorption of any excess of hydrogen sulphide from the spent acid, and consisted merely of two bottles connected by glass tubing and containing a strong solution of potassium hydroxide. This would, of course, be unnecessary in many cases.

Separate sketches show the construction of the two valves, which will offer no difficulties to any one with slight skill in glass tube-working. The valves are simply glass rods of suitable size, drawn out and ground into their seats with turpentine, camphor and emery, before being cut from the long rod. Holes are drilled in the inlet valve-tube *A* by the use of the camphor mixture and a drill made from a round file. To guard against any possibility of the valve in *B* being carried upward by the current of liquid and consequently stopping the upper opening of the valve-tube, its top is pinched flat while still soft in the flame. Devices for washing and drying the gas are omitted from the drawing, as they would obviously vary with the gas and the use to which it was to be put.

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