In these determinations 200 grams of the mixture of sand and permanganate and 50 cc. of 38 per cent. formaldehyde were used. During the process a considerable quantity of water distilled over. The greater part of the water came from the formaldehyde solution; a small quantity was formed by the oxidation of the formaldehyde. Measurements showed that about 45 cc. distilled.

The above averages indicate that with the quantities of permanganate and formaldehyde used in these experiments, the best results were obtained by allowing thirty minutes to complete the reaction. When more than that is taken, the amount of formaldehyde liberated seems to decrease and the amount of carbon dioxide to increase. With less than thirty minutes to complete the reaction, the amount of formaldehyde decreases and the amount of carbon dioxide seems also to decrease. Determinations of both carbon dioxide and formic acid are now being made.

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NOTES.

A Modification of the Hanging Drop Fluoride Test.—The necessary apparatus consists of a test-tube of small bore and about 2 inches long (a litmus-paper bottle serves admirably), fitted with a rubber stopper. The latter carries a small bit of glass tubing, closed at one end and inserted in the bottom of the stopper so that the open end shall extend about 3 mm. into the tube.

The precipitate of calcium carbonate and calcium fluoride, ignited until nearly free from carbonate, is well mixed with about 0.1 gram of precipitated silica and introduced into the dry tube. The bit of glass tubing is nearly filled with a couple of drops of water, the bottom of the stopper wiped thoroughly dry, and the latter inserted into the tube immediately following the addition of 1 to 2 cc. strong sulphuric acid. Place the tube in a beaker of water at the boiling-point and maintain at this temperature for fifteen to thirty minutes. If the substance under examination contained any appreciable quantity of fluoride its presence will be promptly indicated by the formation of a heavy gelatinous ring that not infrequently completely fills the end of the tube in the stopper.

In the writer's estimation, this procedure is far preferable to the troublesome and occasionally somewhat uncertain etching

test usually employed. Furthermore, by simultaneously proceeding with tubes containing known amounts of fluoride, this process may be made roughly quantitative.

C. D. HOWARD.

The Disposal of Ammonia, Tar and Gas from By-Product Coke Ovens.—The writer's attention has been called to a review in the June number of the Journal, of the book entitled "A Short Treatise on the Destructive Distillation of Bituminous Coal," in which the reviewer draws some conclusions as to the disposal of coke oven by-products that hardly seem justified when the rapid development of these markets in recent years is considered, as well as their present status. The review questions whether the addition of a plant carbonizing 1,000 tons of coal daily, to the present by-product oven installation, producing approximately three and a quarter million gallons of tar and 3,500 net tons of ammonium sulphate per year, would not so depress the by-product market as to "deprive that type of construction not only in the new plants, but also in those previously erected, of the greater part, if not all, of the advantages resulting from its output of by-products."

The market for ammonia in all forms, including sulphate, has undergone an increase from 18,000 net tons of sulphate equivalent produced in 1899, to 54,664 net tons in 1904, or, roundly, 200 per cent. increase in five years. The average price has consistently risen during this addition and has shown to date no tendency to recede. As the imports of sulphate were 6,976 net tons in 1899, and 15,288 net tons in 1905, any apprehension as to a catastrophe in this particular industrial field by the addition of 3,500 tons to the home production may well be laid aside until needed. Such an installation as cited requires a year for its completion, which is ample notice for the market to adjust itself to requirements. To one who appreciates the vast field open to ammonium sulphate as a fertilizer, and who is aware that the United States, the greatest agricultural country in the world, now uses but one-third of the nitrogen used as a fertilizer in Germany, per unit of population, including the large nitrate of soda imports in both countries, such apprehensions seem idle.

The market for tar, it is true, furnishes more reasonable ground for conservatism. The tar from the 3,000 odd by-product coke