

Analysis.

I. 0.4348 gram of the salt and 2.0797 grams of ferrous ammonium sulphate, showed the presence of 0.0143 gram of oxygen, equivalent to 3.31 per cent., instead of 3.50 per cent.

II. 0.2612 gram of the persulphate and 2.1132 grams of ferrous ammonium sulphate showed 0.008439 gram of oxygen, equal to 3.59 per cent., instead of 3.50 per cent., by theory.

Upon determining the solubility of the persulphate by V. Meyer's method, it was found that 100 parts of water dissolved 8.71 parts of the salt at 23° C.; again, 100 parts dissolved 8.98 parts of the persulphate at the same temperature

THALLIUM PERSULPHATE.

As thallium in some respects resembles the alkali metals, it occurred to us that perhaps it might also yield a persulphate. Accordingly, a saturated solution of its sulphate, treated with sulphuric acid (sp. gr. 1.70), as in the preceding examples, was chilled and electrolyzed.

Anode surface 1.57 sq. cm.....	0.45 A.
Voltage.....	14

At the expiration of an hour a white precipitate began to separate at the anode. It proved to be very soluble in water, and difficulty was experienced in getting it pure. In fact it decomposed so rapidly in the air that the analysis of it was abandoned. Its aqueous solution rapidly oxidized ferrous salts and set iodine free from potassium iodide. More than this we cannot offer for this salt which is undoubtedly produced in the oxidation of thalious sulphate.

THE CHROMIC ACID TEST FOR COCAINE.

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SINCE the publication of my proposed new test for cocaine, several articles have appeared in criticism thereof, which call for some reply.

P. W. Squire¹ states that the test "produces a turbidity in solutions of the best commercial samples of cocaine hydrochlorate." Further than this he does not go, but in a note appended

¹ "The New Test for Cocaine," *Chemist and Druggist*, April 22.

to his communication, the editor states that the "value of the chromate test is questionable." A. J. Crownley,¹ objects on the ground that the test is too delicate and that only a "synthetic" cocaine would stand it. The most satisfactory reply to these critics is the statement that the finest commercial brands of cocaine hydrochloride satisfactorily answer the chromic acid test.

E. Merck,² in criticizing the test states that the strength of the hydrochloric acid will affect the results obtained. In applying the test he found that a solution of cocaine to which he had added five cc. of ten per cent. hydrochloric acid, yielded negative results, and that upon increasing the amount of acid by using five cc. twelve and one-half per cent. hydrochloric acid, a turbidity was produced, thus in the first case showing the cocaine to be pure, and in the second case indicating impurities. This is in accord with my own observations, and the difference in the results is due to the fact that the sample of cocaine employed contained only very minute traces of amorphous alkaloids, the chromates of these latter bodies being far less soluble in the solution containing the higher percentage of hydrochloric acid. The turbidity will therefore be produced more rapidly and more distinctly than in the solution containing the weaker acid. An acid of ten per cent. strength was decided upon, as it is sufficient to indicate such very small traces of amorphous impurities, that only the very best brands of cocaine in the market will stand this test, and it, together with the permanganate test, guarantees a purity of product which cannot be obtained when McLagan's test is taken as the standard. If the reaction is carried out with a stronger acid, it is necessary to do so side by side with a specimen of chemically pure cocaine as at a low temperature cocaine chromate causes a turbidity in the more acid solution.

Merck further claims that the results are influenced by the age of the chromic acid solution. My own experience has failed to prove that such is the case. In a recent series of experiments with a number of samples of cocaine, using the same solution of chromic acid for fourteen consecutive days, and always applying the test side by side with a freshly prepared chromic acid solu-

¹ "Note on a New Test for Cocaine," *Pharmaceutical Journal*, April 15.

² "Cocaine Tests," *Pharm. Ztg.*, No. 42.

tion, at no time was there noticed any difference in the results obtained.

In applying the test it is important that the temperature of the cocaine solution be maintained at 15° C., the chromates of both pure cocaine and the amorphous alkaloids being influenced by rise and fall of temperature, heat increasing and cold diminishing their solubility. The test produces no turbidity when the acid is added to a solution of a pure specimen of cocaine, the temperature being 15° C. If, however, the solution be subjected to a considerably lower temperature, it becomes turbid, and if it be preserved at this reduced temperature for several hours, a crystalline deposit will be found, consisting of long needle-shaped crystals of cocaine chromate. A solution of impure cocaine rendered turbid by the reagent at 15° C., and exposed to a lower temperature remains turbid for several hours, then slowly deposits a yellowish-brown amorphous sediment. These reactions are characteristic and serve to distinguish between cocaine and the amorphous alkaloids, especially isotropylcocaine. If a stronger acid is used the alkaloids will separate out quicker.

In order to show the superiority of the chromate test over McLagan's test, I prepared a series of specimens of cocaine of different degrees of purity. These, as well as the various brands of cocaine in the market, I subjected to McLagan's and the chromate test. As a result, I found specimens which gave negative results with McLagan's test, to be impure by the chromate test, and those specimens which reacted with McLagan's test yielded a decided turbidity upon the addition of even less than five cc. of the ten per cent. hydrochloric acid.

NOTES.

On the Reichert Figure of Butter.—During the last few years I have had occasion to examine a great many samples of butter, intended for exportation to Venezuela and other South American ports. As many of these samples were of very low grade, it occurred to me that a compilation of the Reichert figures obtained might be of interest to those engaged in this line of work, and I therefore take pleasure in submitting to the society the results of some 317 analyses, taken at random from my