

## ON THE DETECTION OF NITROUS ACID IN NATURAL WATERS AND OTHER DILUTE SOLUTIONS.

By R. FRESenius.

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IN a previous number (vol. 12, p. 427) the author recommended the following as the most sensitive and reliable method for detecting nitrous acid in natural waters. The water, after acidification with pure acetic acid, is distilled and the distillate received into potassic iodide, and starch solution, acidified with sulphuric acid.

To this method Kämmerer raised the following objections:—

1. That nitrates upon warming in presence of organic substances are reduced to nitrites; and
2. That the nitrous acid after liberation might upon warming be reduced by organic matter to nitrous oxide, nitrogen, or ammonia.

In the present paper Dr. Fresenius quotes the results of Plugge and Gratama to disprove the first objection raised by Kämmerer, and gives a series of experiments showing the second objection to be wrong.

Still maintaining, therefore, the accuracy of his own method, Dr. Fresenius gives a caution against its use for waters where bacteria in the presence of hydrocarbons may have reduced nitrates; and in such as contain abnormal substances, which would destroy the nitrous acid when formed *e.g.* sulphuretted hydrogen.

F. J. L.

## ON THE SEPARATION OF MORPHIA AND SUGAR.

*The Pharmaziesche Zeitung*, Berlin, of the 28th March, contains a paper by Dr. Schacht on the separation of morphia and sugar, a subject of some interest to analysts in this country, when we remember the frequent occurrence of morphia poisoning by sweetened soothing syrups, and other patent medicines containing this Alkaloid. Dr. Schacht having found the estimation of morphia in powders containing sugar, to be by no means satisfactory, made the following experiment: 0.075 grs. of muriate of morphia was mixed with 0.5 grams of sugar, and the mixture treated with commercial absolute alcohol, to which a trace of hydrochloric acid had been added. On the addition of ammonia to the resulting yellow solution, no precipitate was obtained. In the second experiment, the mixture was treated in the cold, without the addition of acid; the alcoholic solution evaporated in the water bath, and the residue dissolved in acidulated water; on treating this solution with ammonia and amyl alcohol, it yielded a residue which was coloured red by sulphuric acid, and consisted of a compound of sugar and morphia. The author was not more successful when he treated the substance in the cold with amyl alcohol, and the results yielded by chloroform were still more unsatisfactory. Acid carbonate of potash, precipitated the greater part of the morphia from the aqueous solution, but not enough for quantitative purposes. From these results the author concludes that the separation of morphia and sugar is as yet impossible. Dr. Schacht promises to communicate his further investigations on this subject.

H. de A. P.

## VOLUMETRIC ESTIMATION OF SULPHURIC ACID.

MR. EDWARD HART, in the *American Chemist*, for February, 1876, in pointing out certain difficulties in the volumetric estimation of sulphuric acid, suggests the following process. A straight tube of glass is drawn out to a fine point at one end, and into the other end some fine asbestos is introduced, and tightly pressed down towards the contracted end. The tube is then drawn out just behind the asbestos. When the small end is placed in a turbid fluid, and suction applied at the wide end, the liquid, perfectly cleared, ascends into the tube. When the action is reversed and the clear liquid is forced through the small end, a few drops appear turbid, but the bulk of the liquid remains clear and fit for testing. A few drops of the liquid are forced into a very small and carefully cleaned test tube, and a drop of standard solution of barium chloride from the burette added. Should a precipitate be formed, the test tube and filtering pipette are rinsed into the bulk of the solution, and more barium chloride added. On the proper point being reached, a precipitate is formed in the clear liquid by both barium and sulphuric acid solution. The solution, after each addition of barium chloride, is heated nearly to boiling. Mr. Hart states that where great exactness is not requisite this process is valuable. The average of four determinations of sulphuric acid in cupric sulphate, gave 31.92 per cent., the theoretical quantity being 32.08.—C. A. C.