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SCHOOL OF PHARMACY,
UNIVERSITY OF FLORIDA,
GAINESVILLE, FLA.

A NOTE ON THE ARSENIC TEST FOR REDUCED IRON.*

BY MARGARETHE OAKLEY AND JOHN C. KRANTZ, JR.[1]

INTRODUCTION.

The preparation of the chemicals to be tested for arsenic by the modified Gutzeit's test in many instances is tedious and time-consuming. This is especially true with reduced iron. The residue remaining after the solution of the iron in acid, is oxidized by a chlorate-hydrochloric acid treatment, evaporated, treated with sulphurous acid and again evaporated before subjecting it to the arsenic test.

In an effort to reduce the time and energy expended in this procedure, this experiment was conducted.

EXPERIMENTAL.

Arsenic associated with the iron in reduced iron occurs generally as the acid-insoluble iron arsenide Fe_3As_2. As early as 1839 Wöhler (1) showed that arsenic in this form did not yield arsine when the iron was dissolved in dilute acids. It was further shown by Sautermeister (2) that the literation of arsine could be accomplished by the addition of zinc to the iron before effecting the acid solution. These observations were confirmed by the authors.

Iron arsenide was prepared by the method of A. Brukl (3) which consists of passing arsine into an alcoholic solution of ferrous ammonium sulphate. A trituration of this substance and reduced iron was prepared containing 0.025 per cent of the arsenide. The reduced iron showed no arsenic prior to the incorporation of the arsenide.

The strips in Group I represent the stains obtained when the trituration was subjected to the U. S. P. treatment.

The strips in Group II represent the stains obtained when the trituration was subjected to a modified treatment described in the following paragraph.

The modified procedure employed is as follows: Transfer 0.050 Gm. of Reduced Iron, accurately weighed, to a Gutzeit bottle. Add bromine T.S. (about 6 cc.) in small divided portions until most of the iron dissolves and a slight excess of bromine remains. Heat the mixture on

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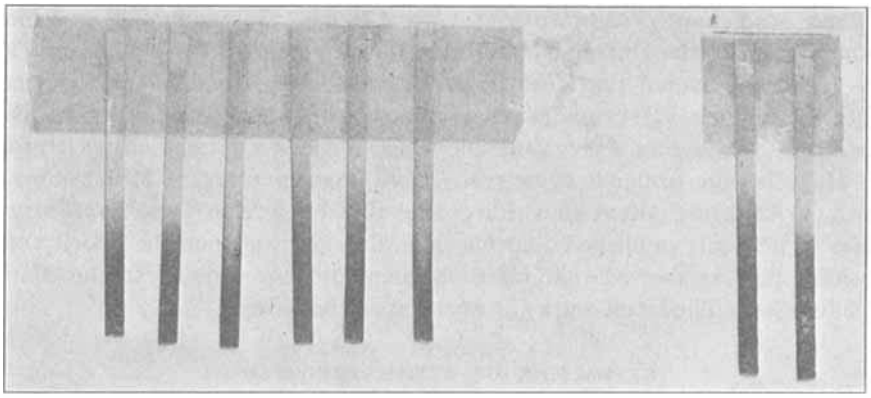
[1] Bureau of Chemistry, State of Maryland Department of Health.

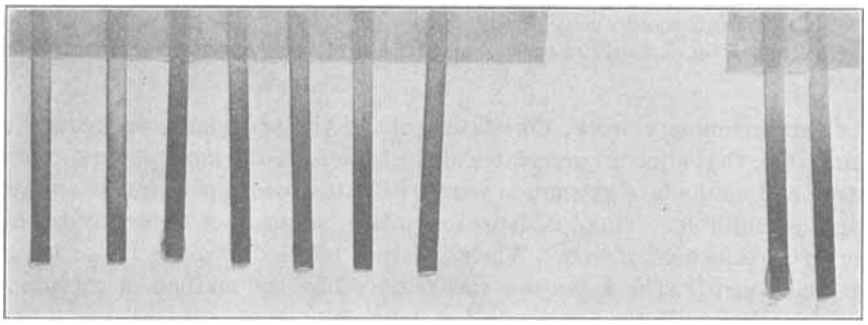
a water-bath for 15 minutes. Subject the solution to arsenic test reversing the addition of the acid-stannous chloride T.S. and the potassium iodide T.S., *i. e.*, adding the acid-stannous chloride T.S. first.



U. S. P. A.

U. S. P. (without SO_2 treatment). B.

GROUP I.



Modified Procedure A.

Modified Procedure (with SO_2 treatment). B.

GROUP II.

CONCLUSION.

An examination of the stains indicates the efficiency of this modified method in preparing the arsenic when in the form of arsenide for the formation of arsine. The simplicity of the modified procedure bespeaks its applicability to routine analysis.

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