

EXAMINATION OF SOME TESTS FOR METHYL ALCOHOL (Abstract of Paper).—By E. W. TODD, B. A., Instructor in Chemistry, Dalhousie University, Halifax, N. S.

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In making recently some tests for methyl alcohol in presence of ethyl alcohol, it was found that unreliable results were obtained with some of the methods tried; and it was thought that a short examination of some of the simpler tests might be useful, with a view to deciding on one that seemed at once satisfactory and of easy application.

Of the methods examined, the most reliable appeared to be the one depending on the development of a violet colour in a solution of fuchsine which had been decolorized by sulphur dioxide, this colour being produced in presence of formaldehyde. The oxidation of the alcohol was accomplished with potassium permanganate in acid solution.

This method is given in the U. S. Pharmacopoeia, 10th Edition, 1926, and is as follows:

TEST FOR METHYL ALCOHOL WITH ETHYL ALCOHOL

“Dilute the alcohol with water to contain about 5 per cent. by volume of ethyl alcohol. To 5 c. c. of this dilute alcohol contained in a test-tube of 20 c. c. capacity, add 0.5 c. c. of phosphoric acid and 2 c. c. of a 3 per cent. aqueous solution of potassium permanganate, and allow the mixture to stand for ten minutes. Add 1 c. c. of a ten per cent. aqueous solution of oxalic acid and allow to stand till the mixture is a transparent brown. Now, add 5 c. c. of a diluted and cooled sulphuric acid, prepared by mixing 3 volumes of distilled water and 1 volume of sulphuric acid, add 5 c. c. of freshly prepared fuchsin-sulphurous acid T. S., mix well and allow to stand for 10 minutes.

“At the end of that time, the solution, when observed against a white background, may have a reddish or pale green tint, but not a distinct blue or violet color (methanol).”

TABLE I

Methylated spirits 10% soln.	Methylated spirits with a few drops of methyl alcohol	Rum say 10%
in 10m. practically, no colour.	in 10m. very distinct violet colour on looking down the tube.	in 20m. no violet colour.
in 30m. distinct though faint violet.	in 20m. darker colour.	in 3 hrs. no violet colour.

Some further results are given in Table II.

TABLE II

Methyl alcohol 2%	Ethyl alcohol 5%	Ethyl alcohol 5% and Methyl alcohol 2%	Methylated spirits 10%	Ethyl alcohol with a few drops of forma- ldehyde added before Schiff's reagent
after 10m. violet-pink colour.	after 10m. no colour	after 10m. violet-pink colour.	after 10m. violet-pink colour.	immediate violet colour

The older U. S. P. Pharmacopeia method was now tried, but was found to be unsatisfactory for the strengths used.

- (1) Methylated spirits 10%—Oxidized by copper spiral in beaker of cold water, the liquid then boiled to drive off the acetaldehyde formed.

Result: A yellowish coloration obtained.

- (2) 10% methylated spirits to which a drop of formaldehyde was added after oxidation by the copper spiral.
Result: Fine pink colour changing to brownish.
- (3) Repeated (1). Result: Yellowish colour, slight turbidity.

MORPHINE TEST—

Preliminary Experiment.

To a solution of morphine in conc. sulphuric acid was added a little dilute formaldehyde solution.

Result: Distinct violet colour.

- (1) To a solution of morphine in concentrated sulphuric acid was added a 2% methyl alcohol solution oxidized three times by a copper spiral.
Result: Violet colour not so distinct as above.
- (2) Same as (1), only ethyl alcohol about 10% used.
Result: No colour.
- (3) Same, only 10% solution of methylated spirits used.
Result: No good colour obtained.
- (4) Same, only full strength methylated spirits used.
Result: A violet coloured ring.

In each case, the spirit was oxidized by a copper spiral.

TEST USING MILK AND RESORCINOL.

The results were not found to be consistent—in some cases, the milk apparently contained a preservative that interfered with the test.

The milk, of course, should be tested for formaldehyde before using in these experiments.

Preliminary Experiment.

To some dilute formaldehyde solution a few drops of dilute resorcinol solution were added. This mixture was poured down the side of a test-tube on top of a few cubic centimetres of concentrated sulphuric acid.

Result: A fine rose-pink ring obtained at the junction of the solution and acid.

(1) To some milk a few drops of resorcinol solution were added. This was poured on top of acid as before.

Result: A brownish red ring obtained.

(2) To some milk a few drops of formaldehyde solution were added, and then a few drops of resorcinol solution. The mixture was poured on top of acid as before.

Result: A brownish ring obtained—not pink.

(3) Methyl alcohol (2% solution) oxidized by copper spiral was mixed with milk and a few drops of resorcinol solution added.

Concentrated acid containing a trace of ferric chloride was poured carefully down the side of the tube.

Result: A rose-red ring obtained.

(4) Ethyl alcohol, oxidized by copper spiral and then mixed with milk, was poured on top of concentrated sulphuric acid containing a trace of ferric chloride.

Result: A brownish red ring changing after some time to nearly black in parts.

(5) Same as (4) only 2% methyl alcohol was used.

Result: Very distinct violet ring.

(6) Same as (4) only a mixture of 5% ethyl alcohol and 2% methyl alcohol was used.

Result: Very distinct violet ring.

SUMMARY

Various tests have been tried and some of the results obtained are given above.

The most satisfactory method was considered to be that given in the U. S. Pharmacopoeia 10th Edition, 1926.