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A NOTE ON THE USE OF THE BECHI OR SILVER NITRATE TEST ON OLIVE OILS.

BY I. M. TOLMAN.

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THE author, in working with a large number of salad oils, found that nearly all of them gave a brown coloration with the Bechi test, as ordinarily applied, unless the sample was first purified as described below. The modification of the reagent used was that proposed by Pearman and Moor,¹ and later by Wesson.²

Two grams of silver nitrate are dissolved in 200 cc. of 95 per cent. alcohol, to which 40 cc. of ether and two drops of nitric acid are added. Ten cc. of oil, 10 cc. of amyl alcohol, and 5 cc. of the reagent are mixed in a test-tube.³ Half the mixture is poured into another test-tube and kept for comparison. The other half is heated for ten minutes in a boiling water-bath and compared with the unheated portion. The brown coloration and reduced silver show the presence of cottonseed oil. Treated in this way, some oils which were especially rancid gave a strong test with the Bechi reagent, but from the physical and chemical constants and the Halphen reaction cottonseed oil could not have been present.

It has been advised to heat the oil for one hour at 100°, but this, while it reduced the reaction of the reagent with other oils, also weakened the reaction with cottonseed oil and was not at all satisfactory.

Wesson advises treatment with 2 per cent. nitric acid, but while this purified the oil in some cases it could not be depended on always, since quite a number of the oils treated in this way gave strong reactions although they contained no cottonseed oil.

The use of a dilute alkali works very well but is inconvenient, for it emulsifies and separates very slowly. A method which is much easier, more rapid, and one which gives very satisfactory results is as follows :

To about 25 cc. of the oil add 25 cc. of 95 per cent. alcohol,

¹ Allen's "Commercial Organic Analysis," Vol. II, Part I, second edition, p. 143.

² This Journal, 17, 724.

³ Amyl alcohol is used to dissolve the fats or oils and thus secure a much better mixture with the reagent.

heat gently, and shake vigorously; allow to stand until the liquids separate, decant as much of the alcohol solution as possible, and then wash the residue with 2 per cent. nitric acid and finally with water. Cottonseed oils treated in this manner reacted with undiminished strength, while the olive oils which before treatment gave deep brown colorations, showed after treatment no coloration or reduction of the silver solution at all. The free fatty acids and other products of rancidity, which are evidently the cause of the brown coloration with the Bechi reagent which these oils give, are dissolved by the alcohol and removed while the reducing principle of the cottonseed oil is not affected. This method can be readily applied to lards or other fats which it is desirable to test by the Bechi reagent. The writer was able, by this method, to get very satisfactory and reliable results.

A STUDY OF THE BECHI TEST FOR COTTONSEED OIL.

BY AUGUSTUS H. GILL AND CHARLES H. DENNISON.

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WHILE in the case of sesame oil the substances to which the Baudouin test is due may be said to be fairly well known,¹ such is not the case with the test in question. Some² consider that it is due to a sulphur compound in the oil and others³ to an aldehydic body. While the evidence given by this paper is not conclusive, it was thought sufficiently interesting to publish.

The tests made by these various experimenters were repeated and confirmed; it was found that an oil heated to 260° gave neither the Bechi-Milliau test nor the Halphen test. This might indicate that the active principle of both tests was the same but for the fact that Raikow,⁴ by oxidizing the oil with potassium permanganate and sulphuric acid, obtained an oil which gave the Bechi test but not the Halphen.

TESTS FOR ALDEHYDIC BODIES.

400 cc. of oil were shaken with an equal quantity of strong sodium bisulphite solution for twelve hours; the oil upon separation gave the Bechi test although a longer time was required for

¹ Villavecchia and Fabris: *Abstr. J. Soc. Chem. Ind.*, 16, 1045.

² Dupont: *Bull. Soc. Chim.*, 13, 696; Charabot and March: *Ibid.*, 21, 552.

³ Holde: *J. Soc. Chem. Ind.*, 11, 637; Wilson: *Chem News*, 59, 99.

⁴ *Chem. Ztg.*, 24, 562, 583.