



Standard Test Methods for Iron in Rosin Tall Oil Fatty Acids and Other Related Products¹

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This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 These test methods cover colorimetric procedures for the determination of iron in rosin tall oil fatty acids and other related products. Both spectrophotometric and visual methods are covered.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Significance and Use

2.1 Iron is a possible contaminant in naval stores products, being introduced into these products during their production from various raw material sources. Gum rosin in particular is prone to iron contamination as the equipment used for its collection and processing is often made from iron containing metals.

2.2 Iron is a troublesome contaminant in rosin and fatty acids, as even trace quantities will catalyze the oxidation and a subsequent darkening of these products.

2.3 The test methods described in this standard were developed many years ago and to a large extent have been replaced by modern instrumental methods such as atomic absorbance and inductively coupled plasma spectroscopies. The test methods described in this standard are subject to interferences from other species in the sample being tested. However, the test methods described here are acceptable if approximate or trend values are required and if appropriate analytical instrumentation is not available.

3. Reagents

3.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Commit-

tee on Analytical Reagents of the American Chemical Society, where such specifications are available.² Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

3.2 Unless otherwise indicated, references to water shall be understood to mean deionized or distilled water.

SPECTROPHOTOMETRIC METHOD

4. Summary of Test Method

4.1 Ferrous iron, in a dilute hydrochloric acid solution, forms a red-colored complex with 1,10-phenanthroline. The intensity of the color is measured at approximately 505 nm by means of a spectrophotometer.

5. Apparatus

5.1 *Photometer*—Any spectrophotometer or filter photometer that will measure accurately the transmittance of the solutions in the range from 500 to 520 nm.

5.2 *Dishes*, high-silica glass,³ silica, or porcelain, 50 and 100-mL capacity.

NOTE 1—Platinum or platinum-rhodium dishes are not recommended as they sometimes cause a color interference with the phenanthroline reagent.

5.3 *Watch Glasses*, to cover the dishes described in 5.2.

5.4 *Pipets*—One 100-mL, two 10-mL, three 5-mL, and two 2-mL pipets.

5.5 *Measuring Pipet*, Mohr-type, 10-mL.

5.6 *Volumetric Flasks*, 1-L and 50-mL capacities.

5.7 *Absorption Cells*, having a capacity of at least 25 mL.

² *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopeia and National Formulary*, U.S. Pharmacopoeial Convention, Inc. (USPC), Rockville, MD.

³ The sole source of supply of the high-silica glass known to the committee at this time is Vycor. If you are aware of alternative suppliers, please provide this information to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.

¹ These test methods are under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and are the direct responsibility of Subcommittee D01.34 on Naval Stores.

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