



Designation: D483 – 04 (Reapproved 2018)

Standard Test Method for Unsulfonated Residue of Petroleum Plant Spray Oils¹

This standard is issued under the fixed designation D483; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the determination of unsulfonated residue in plant spray oils of petroleum origin and applies only to the petroleum oil content. It provides a measure of the degree of refinement of plant spray oils by determining the extent to which the oil is attacked by 98.61 % sulfuric acid under closely standardized conditions. Since the relationship between unsulfonated residue and the actual composition of the oil is not known, this test method should be applied only for measuring the degree of refinement and not for the determination of aromatics or olefins, or both.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D1193 Specification for Reagent Water

D1250 Guide for Use of the Petroleum Measurement Tables

D1298 Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.06 on Analysis of Liquid Fuels and Lubricants.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

D4052 Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter

D4057 Practice for Manual Sampling of Petroleum and Petroleum Products

D4177 Practice for Automatic Sampling of Petroleum and Petroleum Products

3. Terminology

3.1 *Definitions:*

3.1.1 *unsulfonated residue, n*—in oils, that portion of an oil remaining unsulfonated after treatment with concentrated sulfuric acid.

4. Summary of Test Method

4.1 A measured volume of sample is shaken with 98.61 % sulfuric acid at 100 °C in a Babcock bottle, shaking mechanically for 10 s at 10 min intervals. The volume not absorbed by the acid is a measure of the unsulfonated residue in the sample.

5. Significance and Use

5.1 This test method is useful for distinguishing between oils that are adaptable to various types of spraying application, with a higher unsulfonated oil being required for leaf spraying as compared to dormant vegetation application.

6. Apparatus

6.1 *Sulfonation Flask*—The flask is shown in Fig. A1.1 and described in Annex A1.

6.2 *Meniscus Viewing Lens*, focusing type, consisting of eyepiece and objective to facilitate reading the meniscus with a minimum of parallax, is recommended.

6.3 *Water Baths*—Two water baths maintained at 25 °C $\pm$ 0.5 °C and 99.5 °C to 100 °C, and conforming to the requirements prescribed in Annex A1.

6.4 *Shaking Machine*—The exact design described in the appendix is required for uniform control of shaking and precision results. Hand shaking is permissible if technique is developed to correlate results by machine shaking.

6.5 *Centrifuge*—A centrifuge as described in Annex A1 is recommended.