Designation: D2023 – 89 (Reapproved 2016)

# Standard Test Method of Analysis for Sodium Toluene Sulfonate in Detergents[1]

This standard is issued under the fixed designation D2023; 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 analysis for the apparent sodium toluene sulfonate (NaTS) content of detergents.

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 and health practices and determine the applicability of regulatory limitations prior to use.* Material Safety Data sheets are available for reagents and materials. Review them for hazards prior to usage.

## 2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1193 Specification for Reagent Water

## 3. Summary of Test Method

3.1 This test method is based on the separation of the low molecular weight sulfonate from interfering higher molecular weight sulfonates and determination by ultraviolet absorption. The higher molecular weight sulfonates are extracted as sulfonic acids in a hydrochloric acid solution using ethyl ether as the solvent.

## 4. Significance and Use

4.1 This test method is of use to anyone engaged in compositional analysis of detergent formulations. This would include formulators, and analysts employed by companies that manufacture the components usually included in such formulations.

## 5. Interferences

5.1 Any low molecular weight substituted benzene sulfonate or benzene sulfonate (NaBS) itself will interfere and give an apparent toluene sulfonate figure. Since the method is standardized using *p*-toluene sulfonate, *o*-sulfonate will not be assayed correctly. When contamination is suspected, it should be checked by running a complete absorption curve and comparing with known samples.

## 6. Apparatus

NOTE 1—Absolute cleanliness of apparatus is essential. Use glass apparatus only. Contact with rubber, cork, or hands will introduce absorbance errors.

6.1 *Separatory Funnels,* 500-mL capacity, glass-stoppered, pear-shaped.

6.2 *Balance,* analytical.

6.3 *Spectrophotometer* (Note 2), with necessary ultraviolet accessories for working in the range from 230 to 300 nm. These include 1.00 and 5.00-cm absorption cells with quartz windows.

NOTE 2—Details of the test method as written are based on the use of the Beckman DU or Cary recording spectrophotometers. Equivalent spectrophotometers also may be used, provided suitable modifications can be made in the details of the method.

## 7. Reagents

7.1 *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 Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.[3] 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.

7.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean reagent water conforming to Specification D1193.

[1] This test method is under the jurisdiction of ASTM Committee D12 on Soaps and Other Detergents and is the direct responsibility of Subcommittee D12.12 on Analysis and Specifications of Soaps, Synthetics, Detergents and their Components.

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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.

[3] *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. Pharmacopeial Convention, Inc. (USPC), Rockville, MD.