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Standard Test Methods for Detergent Alkylate[1]

This standard is issued under the fixed designation D1569; 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 These test methods cover the various test methods that are applicable to alkylbenzene in order to evaluate those properties pertinent to the characterization of the alkylbenzene with respect to its suitability for desired uses.

NOTE 1—Detergent alkylate comprises alkylbenzenes prepared by varying processes, of varying alkyl chain configuration and length. The alkylate is sulfonated for surfactant use, the largest application being in detergent products. Careful control of detergent alkylate characteristics is desired, for along with sulfonation procedure, variations of the sulfonate can ensue that may result in either desirable or undesirable end-use properties.

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.* For a specific hazards statement, see Section 4.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D88 Test Method for Saybolt Viscosity

D92 Test Method for Flash and Fire Points by Cleveland Open Cup Tester

D156 Test Method for Saybolt Color of Petroleum Products (Saybolt Chromometer Method)

D270 Methods of Sampling Petroleum and Petroleum Products (Withdrawn 1984)[3]

D445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)

D484 Specification for Hydrocarbon Dry Cleaning Solvents (Withdrawn 1982)[3]

D611 Test Methods for Aniline Point and Mixed Aniline Point of Petroleum Products and Hydrocarbon Solvents

D848 Test Method for Acid Wash Color of Industrial Aromatic Hydrocarbons

D891 Test Methods for Specific Gravity, Apparent, of Liquid Industrial Chemicals

D1133 Test Method for Kauri-Butanol Value of Hydrocarbon Solvents

D1159 Test Method for Bromine Numbers of Petroleum Distillates and Commercial Aliphatic Olefins by Electrometric Titration

D1193 Specification for Reagent Water

D1218 Test Method for Refractive Index and Refractive Dispersion of Hydrocarbon Liquids

D1364 Test Method for Water in Volatile Solvents (Karl Fischer Reagent Titration Method)

3. Purity of 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 Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.[4] 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.

[1] These test methods are under the jurisdiction of ASTM Committee D12 on Soaps and Other Detergents and is the direct responsibility of 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] The last approved version of this historical standard is referenced on www.astm.org.

[4] *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.

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3.2 Unless otherwise indicated, references to water shall be understood to mean reagent water conforming to Specification D1193.

4. Hazards

4.1 All reagents and chemicals should be handled with care. Before using any chemical, read and follow all safety precautions and instructions on the manufacturer's label or MSDS (Material Safety Data Sheet).

5. Sampling

5.1 Unless otherwise indicated in a specific test method, sample the material in accordance with Methods D270, with especial application of Sections 41 and 42 pertaining to industrial aromatic hydrocarbons.

FLASH POINT

6. Procedure

6.1 Determine the flash point in accordance with Test Method D92.

WATER OR MOISTURE

7. Procedure

7.1 Determine water or moisture in accordance with Test Method D1364.

SPECIFIC GRAVITY

8. Procedure

8.1 Determine the specific gravity in accordance with Tests Methods D891. The methods include procedures using the specific gravity balance, hydrometer, pycnometer, and vacuum pycnometer.

COLOR

9. Procedure

9.1 Determine the color in accordance with Test Method D156.

DOCTOR TEST

10. Procedure

10.1 Carry out the Doctor Test in accordance with Specification D484.

VISCOSITY

11. Procedure

11.1 Determine the viscosity as follows:
11.1.1 *Preferred Method*—Test Method D445.
11.1.2 *Alternative Method*—Test Method D88.

ANILINE POINT

12. Procedure

12.1 Determine the aniline point in accordance with Test Method D611. Alternatively, the kauri-butanol test (13) may be made instead.

KAURI-BUTANOL

13. Procedure

13.1 Determine the kauri-butanol value in accordance with Test Method D1133. Alternatively, the aniline point test may be made instead.

REFRACTIVE INDEX

14. Procedure

14.1 Determine the refractive index in accordance with Test Method D1218. Other equivalent or comparable apparatus may be used in place of that prescribed in Test Method D1218. Read to the fourth decimal place.

BROMINE NUMBER

15. Procedure

15.1 Determine the bromine number in accordance with Test Method D1159 with the following modifications:
15.1.1 Reduce the concentration of the bromide-bromate solution (5.3 of Test Method D1159) to 0.1 *N*.
15.1.2 For low unsaturation, increase the size of the sample to 50 g.

SEDIMENT

16. Scope

16.1 This method covers procedures for sampling and the estimation of sediment in detergent alkylate.

17. Apparatus

17.1 *Nessler Tubes,* 50-mL capacity, 25 mm outside diameter.

18. Procedure

18.1 Transfer the sample of a Nessler tube (25 mm outside diameter) and immediately view horizontally against a white background. Record the presence or absence of any suspended matter or sediment.

ACID WASH COLOR

19. Procedure

19.1 Determine the acid wash color in accordance with Test Method D848. Include detergent alkylate in Group I in Table I of Test Method D848.

20. Keywords

20.1 chemical analysis; detergent alkylate; physical testing

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