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An American National Standard

Standard Methods of Testing Detergent Alkylate¹

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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 *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. Referenced Documents

2.1 ASTM Standards:

- D 88 Test Method for Saybolt Viscosity²
- D 92 Test Method for Flash and Fire Points by Cleveland Open Cup³
- D 156 Test Method for Saybolt Color of Petroleum Products (Saybolt Chromometer Method)³
- D 270 Methods of Sampling Petroleum and Petroleum Products⁴
- D 445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)³
- D 484 Specification for Hydrocarbon Drycleaning Solvents⁵

- D 611 Test Method for Aniline Point and Mixed Aniline Point of Petroleum Products and Hydrocarbon Solvents³
- D 848 Test Method for Acid Wash Color of Industrial Aromatic Hydrocarbons⁶
- D 891 Test Methods for Specific Gravity, Apparent, of Liquid Industrial Chemicals⁷
- D 1133 Test Method for Kauri-Butanol Value of Hydrocarbon Solvents⁶
- D 1159 Test Method for Bromine Number of Petroleum Distillates and Commercial Aliphatic Olefins by Electro-metric Titration³
- D 1193 Specification for Reagent Water⁸
- D 1218 Test Method for Refractive Index and Refractive Dispersion of Hydrocarbon Liquids³
- D 1364 Test Method for Water in Volatile Solvents (Fischer Reagent Titration Method)⁶

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.⁹ 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 reagent water conforming to Specification D 1193.

4. Sampling

4.1 Unless otherwise indicated in a specific test method, sample the material in accordance with Methods D 270, with

¹ These test methods are under the jurisdiction of ASTM Committee D-12 on Soaps and Other Detergents and is the direct responsibility of D12.12 on Analysis of Soaps and Synthetic Detergents.

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² *Annual Book of ASTM Standards*, Vol 04.04.

³ *Annual Book of ASTM Standards*, Vol 05.01.

⁴ Discontinued; see 1984 *Annual Book of ASTM Standards*, Vol 05.01.

⁵ Discontinued; see 1982 *Annual Book of ASTM Standards*, Part 23.

⁶ *Annual Book of ASTM Standards*, Vol 06.04.

⁷ *Annual Book of ASTM Standards*, Vol 15.05.

⁸ *Annual Book of ASTM Standards*, Vol 11.01.

⁹ *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.



especial application of Sections 41 and 42 pertaining to industrial aromatic hydrocarbons.

FLASH POINT

5. Procedure

5.1 Determine the flash point in accordance with Test Method D 92.

WATER OR MOISTURE

6. Procedure

6.1 Determine water or moisture in accordance with Test Method D 1364.

SPECIFIC GRAVITY

7. Procedure

7.1 Determine the specific gravity in accordance with Tests Methods D 891. The methods include procedures using the specific gravity balance, hydrometer, pycnometer, and vacuum pycnometer.

COLOR

8. Procedure

8.1 Determine the color in accordance with Test Method D 156.

DOCTOR TEST

9. Procedure

9.1 Carry out the Doctor Test in accordance with Specification D 484.

VISCOSITY

10. Procedure

10.1 Determine the viscosity as follows:

10.1.1 *Preferred Method*—Test Method D 445.

10.1.2 *Alternative Method*—Test Method D 88.

ANILINE POINT

11. Procedure

11.1 Determine the aniline point in accordance with Test Method D 611. Alternatively, the kauri-butanol test (12) may be made instead.

KAURI-BUTANOL

12. Procedure

12.1 Determine the kauri-butanol value in accordance with Test Method D 1133. Alternatively, the aniline point test may be made instead.

REFRACTIVE INDEX

13. Procedure

13.1 Determine the refractive index in accordance with Test Method D 1218. Other equivalent or comparable apparatus may be used in place of that prescribed in Test Method D 1218. Read to the fourth decimal place.

BROMINE NUMBER

14. Procedure

14.1 Determine the bromine number in accordance with Test Method D 1159 with the following modifications:

14.1.1 Reduce the concentration of the bromide-bromate solution (5.3 of Test Method D 1159) to 0.1 *N*.

14.1.2 For low unsaturation, increase the size of the sample to 50 g.

SEDIMENT

15. Scope

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

16. Apparatus

16.1 *Nessler Tubes*, 50-ml capacity, 25 mm outside diameter.

17. Procedure

17.1 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

18. Procedure

18.1 Determine the acid wash color in accordance with Test Method D 848. Include detergent alkylate in Group I in Table I of Test Method D 848.

19. Keywords

19.1 chemical analysis; detergent alkylate; physical testing

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