Designation: D2349 – 90 (Reapproved 2014)

Standard Test Method for Qualitative Determination of Nature of Solvent Composition in Solvent-Reducible Paints[1]

This standard is issued under the fixed designation D2349; 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 the nature of solvent in solvent-reducible house paints containing only hydrocarbon solvents.

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 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:*[2]

D215 Practice for the Chemical Analysis of White Linseed Oil Paints (Withdrawn 2005)[3]

D233 Test Methods of Sampling and Testing Turpentine

D1193 Specification for Reagent Water

3. Significance and Use

3.1 This test method provides a procedure for determining qualitatively the composition of solvent in paints containing only hydrocarbon solvents.

4. Reagents

4.1 *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.

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

4.3 *Antimony Pentachloride* ($SbCl_5$).

4.4 *Chloroform.*

4.5 *Nitric Acid* (sp gr 1.42)—Concentrated nitric acid (HNO_3).

4.6 *Sulfuric Acid* (sp gr 1.84)—Concentrated sulfuric acid (H_2SO_4).

5. Preparation of Sample

5.1 Mix and prepare the sample in accordance with Practice D215.

6. Nature of Solvent

6.1 Transfer approximately 150 g of the paint to a 500-mL flask fitted with a 2-hole cork stopper carrying a spray trap connected with a suitable condenser. Through the other hole in the stopper pass an influx tube for steam. (This tube should dip below the surface of the paint.) Heat the flask in an oil or air bath at 100°C and pass through it a current of steam; with the steam still passing through, raise the temperature of the bath to 130°C. Catch the distillate in a small separatory funnel; continue distillation until 300 mL of water have been obtained. Portions of this water may be drawn from the cock of the separatory funnel from time to time, but care must be taken not to draw out any of the volatile solvent.

6.2 Let the distillate stand until it separates into two layers, then draw off the water and filter the volatile solvent through a dry filter paper into a dry flask. If the solvent is apparently turpentine, examine the distillate in accordance with Color,

[1] This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.21 on Chemical Analysis of Paints and Paint Materials.

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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.

Odor, Specific Gravity, Refractive Index and Distillation sections of Test Methods D233. If the solvent is a mixture of turpentine and petroleum spirits, an approximate determination of the amount of turpentine may be made in accordance with the Polymerization sections of Test Methods D233. (It should be noted that turpentine is slightly soluble in water, about 0.3 to 0.4 mL/100 mL of water.)

6.3 To test for benzene, add a few drops of the distillate to a small quantity of a mixture of HNO_3 (sp gr 1.42) and H_2SO_4 (sp gr 1.84) and heat cautiously. The characteristic odor of nitrobenzene will be noted if benzene is present.

NOTE 1—Toluene may give a similar odor.

6.4 If the solvent is apparently all petroleum spirits, no further examination is necessary unless further information is desired.

6.5 When the amount of turpentine in the solvent is so small that its presence is questionable, it may be detected by placing 2 drops of the distillate and 2 to 3 mL of chloroform in a dry test tube and adding 1 drop of $SbCl_5$. A slow or slight change in color indicates the absence of turpentine. A rapid change in color to a dark red or purple indicates the possibility of turpentine. The iodine number for turpentine by the Wijs method under these conditions is approximately 340. An iodine number of 20 or over is additional proof of the presence of turpentine and enables calculation of the approximate amount.

7. Keywords

7.1 hydrocarbon solvent; solvent composition