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AMERICAN SOCIETY FOR TESTING AND MATERIALS
100 Barr Harbor Dr., West Conshohocken, PA 19428
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Standard Test Method for Qualitative Determination of Nature of Solvent Composition in Solvent-Reducible Paints¹

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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 *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:*

D 215 Practice for Chemical Analysis of White Linseed Oil Paints²

D 233 Test Methods of Sampling and Testing Turpentine³

D 1193 Specification for Reagent Water⁴

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.⁵ 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 D 1193.

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 Methods D 215.

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, Odor, Specific Gravity, Refractive Index and Distillation sections of Methods D 233. 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 Methods D 233. (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

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² *Annual Book of ASTM Standards*, Vol 06.01.

³ *Annual Book of ASTM Standards*, Vol 06.03.

⁴ *Annual Book of ASTM Standards*, Vol 11.01.

⁵ *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. Pharmaceutical Convention, Inc. (USPC), Rockville, MD.



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

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