



Designation: D 2119 – 96

Standard Test Method for Aldehydes in Styrene Monomer¹

This standard is issued under the fixed designation D 2119; 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 aldehydes in styrene monomer. Aldehydes are calculated and reported as benzaldehyde.

1.2 The following applies to all specified limits in this test method: for purposes of determining conformance with this test method, an observed value or a calculated value shall be rounded off “to the nearest unit” in the last right-hand digit used in expressing the specification limit, in accordance with the rounding-off method of Practice E 29.

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 specific hazard statements, see Section 7.

2. Referenced Documents

2.1 ASTM Standards:

D 1193 Specification for Reagent Water²

D 3437 Practice for Sampling and Handling Liquid Cyclic Products³

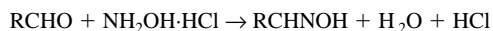
E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications⁴

2.2 Other Documents:

OSHA Regulations, 29 CFR, paragraphs 1910.1000 and 1910.1200⁵

3. Summary of Test Method

3.1 An alcoholic solution of hydroxylamine hydrochloride is added to a specimen of styrene monomer. Active aldehydes present react in accordance with the following equation:



The hydrochloric acid, which is equivalent to the aldehyde

present in the sample, is titrated with standard sodium hydroxide solution. Ketones, if present, interfere by partially reacting with the reagent.

4. Significance and Use

4.1 This test method is suitable for determining the quantity of aldehydes, both for quality control and quality assurance of the product.

5. Apparatus

5.1 *Erlenmeyer Flasks*, glass-stoppered, 250-mL.

5.2 *Pipets*, 25-mL.

5.3 *Volumetric Flasks*, 100-mL.

5.4 *Burets*, 10-mL. (Microburets are preferred.)

5.5 *Thermometers*, capable of differentiating 1°C at ambient.

6. Reagents

6.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society where such specifications are available.⁶ 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.

6.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean reagent water as defined by Type III of Specification D 1193.

6.3 *Hydrochloric Acid, Standard (0.05 N)*—Prepare a 0.05 N solution of hydrochloric acid (HCl) by diluting 4.15 mL of concentrated HCl (density 1.19 g/mL) to 1 L with water.

6.4 *Hydroxylamine Hydrochloride Solution*—Dissolve 20 g of hydroxylamine hydrochloride (NH₂OH·HCl) in 1 L of methanol and neutralize to the red-yellow end point of thymol blue indicator.

6.5 *Methanol*.

6.6 *Sodium Hydroxide, Standard Solution (0.05 N)*—Dissolve 2.00 g of low-carbonate sodium hydroxide (NaOH) in

¹ This test method is under the jurisdiction of ASTM Committee D16 on Aromatic Hydrocarbons and Related Chemicals and is the direct responsibility of Subcommittee D16.07 on Styrene, Ethylbenzene, and C₉ and C₁₀ Aromatic Hydrocarbons.

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² *Annual Book of ASTM Standards*, Vol 11.01.

³ *Annual Book of ASTM Standards*, Vol 06.04.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.

⁵ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

⁶ *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.