



Standard Test Method for Analysis of Styrene by Capillary Gas Chromatography¹

This standard is issued under the fixed designation D5135; 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.

^{ε1} NOTE—Table 3 was editorially corrected in November 2016.

1. Scope*

1.1 This test method covers the determination of the impurities typically found in styrene and uses those values to determine the purity of styrene by difference by gas chromatography. Typical impurities in commercial styrene are found in [Table 1](#).

1.2 This test method is applicable to impurity concentrations in the range of 0.001 to 1.00 % and for styrene purities of 99 % or higher when using the internal standard procedure.

1.3 In determining the conformance of the test results using this method to applicable specifications, results shall be rounded off in accordance with the rounding-off method of Practice [E29](#).

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.5 *This standard does not purport to address all 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 hazard statement, see Section 9.

2. Referenced Documents

2.1 ASTM Standards:²

[D3437](#) Practice for Sampling and Handling Liquid Cyclic Products

[D4307](#) Practice for Preparation of Liquid Blends for Use as Analytical Standards

[D4790](#) Terminology of Aromatic Hydrocarbons and Related Chemicals

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 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.

[D6809](#) Guide for Quality Control and Quality Assurance Procedures for Aromatic Hydrocarbons and Related Materials

[E29](#) Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

[E355](#) Practice for Gas Chromatography Terms and Relationships

[E691](#) Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

[E1510](#) Practice for Installing Fused Silica Open Tubular Capillary Columns in Gas Chromatographs

2.2 Other Document

[OSHA Regulations](#), 29 CFR paragraphs 1910.1000 and 1910.1200³

3. Terminology

3.1 See Terminology [D4790](#) for definitions of terms used in this test method.

4. Summary of Test Method

4.1 In this test method, the chromatogram peak area for each impurity is compared to the peak area of the internal standard (*n*-heptane or other suitable known) added to the sample. From the response factors of these impurities relative to that of the internal standard and the amount of internal standard added, the concentration of the impurities are calculated. The styrene content is obtained by subtracting the total amount of all impurities from 100.00.

5. Significance and Use

5.1 This test method is designed to obtain styrene purity on the basis of impurities normally present in styrene and may be used for final product inspections and process control.

5.2 This test method will detect the impurities shown in [Table 1](#), non-aromatic hydrocarbons containing ten carbons or less, and others where specific impurity standards are available. Absolute purity cannot be determined if unknown impurities are present.

³ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.

*A Summary of Changes section appears at the end of this standard