



Standard Test Method for Trace Impurities in Monocyclic Aromatic Hydrocarbons by Gas Chromatography and External Calibration¹

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1. Scope *

1.1 This test method covers the determination of the total nonaromatic hydrocarbons and trace monocyclic aromatic hydrocarbons in toluene, mixed xylenes, and *p*-xylenes by gas chromatography. The purity of toluene, mixed xylenes, or *p*-xylenes can also be calculated. Calibration of the gas chromatographic system is done by the external standard calibration technique. A similar test method, using the internal standard calibration technique, is Test Method D 2360.

1.2 Total aliphatic hydrocarbons containing 1 through 10 carbon atoms (methane through decanes) can be detected by this test method at concentrations ranging from 0.001 to 2.500 weight %.

1.2.1 A small amount of benzene in mixed xylenes or *p*-xylenes may not be distinguished from the nonaromatics and the concentrations are determined as a composite (see 6.1).

1.3 Monocyclic aromatic hydrocarbon impurities containing 6 through 10 carbon atoms (benzene through C_{10} aromatics) can be detected by this test method at individual concentrations ranging from 0.001 to 1.000 weight %.

1.4 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.

1.5 *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 statement, see Section 9.

2. Referenced Documents

2.1 ASTM Standards:

D 841 Specification for Nitration Grade Toluene²

D 2306 Test Method for C_8 Hydrocarbon Analysis by Gas Chromatography²

D 2360 Test Method for Trace Impurities in Monocyclic Aromatic Hydrocarbons by Gas Chromatography²

D 3437 Practice for Sampling and Handling Liquid Cyclic Products²

D 4052 Test Method for Density and Relative Density of Liquids by Digital Density Meter³

D 4307 Practice for Preparation of Liquid Blends for Use as Analytical Standards³

D 4534 Test Method for Benzene Content of Cyclic Products by Gas Chromatography²

D 4790 Terminology of Aromatic Hydrocarbons and Related Chemicals²

D 5136 Specification for High Purity *p*-Xylene²

D 5211 Specification for Xylenes for *p*-Xylene Feedstock²

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

E 260 Practice for Packed Column Gas Chromatography⁵

E 355 Practice for Gas Chromatography Terms and Relationships⁵

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁴

E 1510 Practice for Installing Fused Silica Open Tubular Capillary Columns in Gas Chromatographs⁵

2.2 Other Document:

OSHA Regulations, 29 CFR, paragraphs 1910.1000 and 1910.1200⁶

3. Terminology

3.1 See Terminology D 4790 for definitions of terms used in this test method.

4. Summary of Test Method

4.1 A repeatable volume of the specimen to be analyzed is precisely injected into a gas chromatograph equipped with a flame ionization detector (FID). The peak area of each impurity is measured. Concentration of each impurity is determined

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 D16.04 on Instrumental Analysis.

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² *Annual Book of ASTM Standards*, Vol 06.04.

³ *Annual Book of ASTM Standards*, Vol 05.02.

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

⁵ *Annual Book of ASTM Standards*, Vol 03.06.

⁶ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.

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

