



Designation: D7011 – 24

Standard Test Method for Determination of Trace Thiophene in Refined Benzene by Gas Chromatography and Sulfur Selective Detection¹

This standard is issued under the fixed designation D7011; 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 thiophene in refined benzene using gas chromatography and sulfur selective detection.

1.2 This test method is applicable to the determination of thiophene at levels of 0.02 mg to 2.18 mg thiophene per kg in benzene (mg/kg) on the AED, 0.03 mg/kg to 1.87 mg/kg on the PFPD, and 0.03 mg/kg to 2.11 mg/kg on the SCD. The range of the test method may be extended by modifying the sample injection volume, split ratios, calibration range, or sample dilution with thiophene-free solvent.

1.3 The following applies for the purposes of 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 of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* For specific hazard statements, see Section 8.

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This test method is under the jurisdiction of ASTM Committee D16 on Aromatic, Industrial, Specialty and Related Chemicals and is the direct responsibility of Subcommittee D16.04 on Instrumental Analysis.

Current edition approved Nov. 1, 2024. Published December 2024. Originally approved in 2004. Last previous edition approved in 2019 as D7011 – 15 (2019). DOI: 10.1520/D7011-24.

2. Referenced Documents

2.1 ASTM Standards:²

- D1193 Specification for Reagent Water
- D2359 Specification for Refined Benzene-535
- D3437 Practice for Sampling and Handling Liquid Cyclic Products
- D4734 Specification for Refined Benzene-545
- D4735 Test Method for Determination of Trace Thiophene in Refined Benzene by Gas Chromatography
- D4790 Terminology of Aromatic Hydrocarbons and Related Chemicals
- D5871 Specification for Benzene for Cyclohexane Feedstock
- 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
- E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods
- 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 definition of terms used in this test method.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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