



Designation: D 5060 – 95 (Reapproved 2000)

Standard Test Method for Determining Impurities in High-Purity Ethylbenzene by Gas Chromatography¹

This standard is issued under the fixed designation D 5060; 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 describes the analysis of normally occurring impurities in, and the purity of, ethylbenzene by gas chromatography. Impurities determined include nonaromatic hydrocarbons, benzene, toluene, xylenes, cumene, and diethylbenzene isomers.

1.2 This test method is applicable for impurities at concentrations from 0.001 to 1.000 % and for ethylbenzene purities of 99 % or higher. At this level, *p*-xylene may not be detected.

1.3 The following applies to all specified limits in this standard: for purposes of determining conformance with this standard, 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.

1.4 *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 a specific hazard statement, see Section 7.

2. Referenced Documents

2.1 ASTM Standards:

D 3437 Practice for Sampling and Handling Liquid Cyclic Products²

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

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

E 355 Practice for Gas Chromatography Terms and Relationships⁴

E 1510 Practice for Installing Fused Silica Open Tubular Capillary Columns in Gas Chromatographs⁴

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.

Current edition approved May 15, 1995. Published July 1995. Originally published as D 5090 – 90. Last previous edition D 5090 – 90.

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.

2.2 Other Documents:

OSHA Regulations, 29 CFR, paragraphs 1910.1000 and 1910.1200⁵

3. Summary of Test Method

3.1 A known amount of internal standard is added to the sample. A gas chromatograph equipped with a flame ionization detector and a polar fused silica capillary column is used for the analysis. The impurities are measured relative to the internal standard. Ethylbenzene purity is calculated by subtracting the impurities found from 100.00 %.

4. Significance and Use

4.1 The test is suitable for setting specifications on ethylbenzene and for use as an internal quality control tool where ethylbenzene is used in manufacturing processes. It may be used in development or research work involving ethylbenzene.

4.2 Purity is commonly reported by subtracting the determined expected impurities from 100 %. Absolute purity cannot be determined if unknown impurities are present.

5. Apparatus

5.1 *Gas Chromatograph*—Any gas chromatograph having a flame ionization detector and a splitter injector suitable for use with a fused-silica capillary column may be used, provided the system has sufficient sensitivity to obtain a minimum peak height response of 0.1 mV for 0.010 % internal standard when operated at the stated conditions. Background noise at these conditions is not to exceed 3 μ V.

5.2 *Chromatographic Column*, fused silica capillary, 60 m long, 0.32-mm inside diameter, internally coated to a 0.5- μ m thickness with a bonded (crosslinked) polyethylene glycol. Other columns may be used after it has been established that such column is capable of separating all major impurities and the internal standard from the ethylbenzene under operating conditions appropriate for the column.

5.3 *Recorder*, 1-mV, 1 s or less full scale response or electronic integration with tangent capabilities (recommended).

5.4 *Microsyringe*, 10- μ L.

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