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Designation: 262/85

Standard Test Method for Aromatic Traces In Light Saturated Hydrocarbons By Gas Chromatography¹

This standard is issued under the fixed designation D 2600; 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.

This test method was adopted as a joint ASTM-IP Standard in 1971.

1. Scope

1.1 This test method covers the determination of benzene, toluene, and C_8 aromatics in light saturated hydrocarbon samples. The test method is limited by aromatic selectivity of the stationary liquid to samples containing n -decane as the highest boiling compound.

NOTE 1—Some of the C_{10} naphthenes have boiling points below that of n -decane. Such compounds may be eluted after n -decane on the columns described in this method and may cause interference with the determination of benzene.

1.2 This test method covers the concentration range from 0.005 to 1.00 volume percent of each C_6 to C_8 aromatic carbon number group.

1.3 Results are reported to two significant figures.

1.4 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems 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.*

2. Referenced Documents

2.1 ASTM Standards:

D 2267 Test Method for Aromatics in Light Naphthas, Reformates and Gasolines by Gas Chromatography²

E 260 Practice for Packed Column Gas Chromatography³

3. Summary of Test Method

3.1 The sample is introduced into a gas chromatographic column containing a strongly polar liquid phase. The polar phase has very little affinity for saturated and olefinic hydrocarbons, while exhibiting a pronounced selectivity for aromatics. This selectivity results in the elution of all saturated and olefinic hydrocarbons in the products described above prior to the elution of benzene. Either a thermal conductivity or flame ionization detector may be used. Calibration is performed by using synthetic blends of

the aromatic compounds charged at the same constant volume as is used to analyze the sample. n -Undecane or n -dodecane is used as an internal standard.

NOTE 2—Reference should be made to Practice E 260.

4. Significance and Use

4.1 A knowledge of aromatic traces in light saturated hydrocarbons, such as light naphthas and solvents, is needed to assess purity of solvents and meet product specifications for trace aromatics as may be set by consumers and regulatory agencies.

4.2 This test method is also useful as a complementary method to Test Method D 2267. It enables aromatics to be determined in naphthas and aviation gasolines at concentrations below the lower limit (1.0 volume %) of Test Method D 2267.

5. Apparatus

5.1 *Chromatograph*—Any chromatographic instrument may be used that has the following performance and characteristics:

5.1.1 *Sensitivity*—The system shall be capable of detecting 0.01 volume % of any aromatic compound of interest. For calculation techniques utilizing a recorder, the signal for that concentration shall be at least five chart divisions above the noise level on a 0 to 100 scale chart. Noise level must be restricted to a maximum of one chart division. When electronic integration is employed, the signal for 0.01 % concentration must be at least twice the noise level.

5.1.2 *Sample Inlet System*—A sample inlet system that allows a constant volume of liquid sample to be injected.

5.1.2.1 If the apparatus is equipped with a sample splitter⁴ or if a flame ionization detector is used, check the linearity of the splitter and detector. To do this prepare two standard samples containing 0.5 % and 1.0 volume % each of benzene, toluene, and one of the C_8 aromatics in isooctane, as described in 8.1. Using the same instrument conditions and sample sizes used for the method, inject a constant volume

¹ This test method is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.04 on Hydrocarbon Analysis.

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² *Annual Book of ASTM Standards*, Vol 05.02.

³ *Annual Book of ASTM Standards*, Vol 14.01.

⁴ For further information on the design and performance of splitters see *Analytical Chemistry*, ANCHA, Vol 33, No. 6, 1961, pp. 680–4. *Nature*, NATUA, London, Vol 198, No. 4481, 1963, pp. 681–2. *Open Tubular Columns in Gas Chromatography*, Plenum Press, fourth Part p. 112.