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.

Designation: D6733 – 01 (Reapproved 2020)

Standard Test Method for Determination of Individual Components in Spark Ignition Engine Fuels by 50-Metre Capillary High Resolution Gas Chromatography[1]

This standard is issued under the fixed designation D6733; 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 individual hydrocarbon components of spark-ignition engine fuels with boiling ranges up to 225 °C. Other light liquid hydrocarbon mixtures typically encountered in petroleum refining operations, such as, blending stocks (naphthas, reformates, alkylates, and so forth) may also be analyzed; however, statistical data was obtained only with blended spark-ignition engine fuels. The tables in Annex A1 enumerate the components reported. Component concentrations are determined in the range from 0.10 % to 15 % by mass. The procedure may be applicable to higher and lower concentrations for the individual components; however, the user must verify the accuracy if the procedures are used for components with concentrations outside the specified ranges.

1.2 This test method is applicable also to spark-ignition engine fuel blends containing oxygenated components. However, in this case, the oxygenate content must be determined by Test Methods D5599 or D4815.

1.3 Benzene co-elutes with 1-methylcyclopentene. Benzene content must be determined by Test Method D3606 or D5580.

1.4 Toluene co-elutes with 2,3,3-trimethylpentane. Toluene content must be determined by Test Method D3606 or D5580.

1.5 Although a majority of the individual hydrocarbons present are determined, some co-elution of compounds is encountered. If this procedure is utilized to estimate bulk hydrocarbon group-type composition (PONA) the user of such data should be cautioned that error may be encountered due to co-elution and a lack of identification of all components present. Samples containing significant amounts of naphthenic (for example, virgin naphthas) constituents above *n*-octane may reflect significant errors in PONA type groupings. Based on the interlaboratory cooperative study, this procedure is applicable to samples having concentrations of olefins less than 20 % by mass. However, significant interfering coelution with the olefins above C_7 is possible, particularly if blending components or their higher boiling cuts such as those derived from fluid catalytic cracking (FCC) are analyzed, and the total olefin content may not be accurate. Many of the olefins in spark ignition fuels are at a concentration below 0.10 %; they are not reported by this test method and may bias the total olefin results low.

1.5.1 Total olefins in the samples may be obtained or confirmed, or both, by Test Method D1319 (volume %) or other test methods, such as those based on multidimensional PONA type of instruments.

1.6 If water is or is suspected of being present, its concentration may be determined, if desired, by the use of Test Method D1744. Other compounds containing sulfur, nitrogen, and so forth, may also be present, and may co-elute with the hydrocarbons. If determination of these specific compounds is required, it is recommended that test methods for these specific materials be used, such as Test Method D5623 for sulfur compounds.

1.7 The values stated in SI units are to be regarded as the standard. The values given in parentheses are provided for information only.

1.8 *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.*

1.9 *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 D02 on Petroleum Products, Liquid Fuels, and Lubricantsand is the direct responsibility of Subcommittee D02.04.0L on Gas Chromatography Methods.

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