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: D2712 – 18a

Standard Test Method for Determination of Hydrocarbon Impurities in High Purity Propylene by Gas Chromatography[1]

This standard is issued under the fixed designation D2712; 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 is used for the determination of hydrocarbon impurities in propylene (propene) material of 97 % by mass or greater purity (concentrates). These impurities are determined in the concentration range of 0.35 mg/kg to 8575 mg/kg and includes the following components: methane, ethane, ethylene, propane, acetylene, isobutane, propadiene, normal butane, trans-2-butene, butene-1, isobutylene, cis-2-butene, isopentane, methylacetylene, normal pentane, and 1,3-butadiene.

NOTE 1—Optionally, the analysis may include the determination of pentenes/hexanes and heavier components, see 6.3.

1.2 This test method does not determine non-hydrocarbon impurities, and additional tests may be necessary to fully characterize the propylene sample. However, for the purposes of this test, the purity of propylene is determined as the difference between the total of the determined analytes and 100 % (by difference).

1.3 When this test method is being used for the determination of trace level impurities in high-purity propylene, the use of this test method for the analysis of propylene samples at lower purities is not recommended due to the potential for cross contamination between samples.

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 may involve hazardous materials, operations, and equipment. 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.*

1.6 *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.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1265 Practice for Sampling Liquefied Petroleum (LP) Gases, Manual Method

D3700 Practice for Obtaining LPG Samples Using a Floating Piston Cylinder

F307 Practice for Sampling Pressurized Gas for Gas Analysis

3. Terminology

3.1 *Definitions:*

3.1.1 *liquefied petroleum gas (LPG)*—hydrocarbon gases that can be stored or handled in the liquid phase under moderate conditions of pressure and at ambient temperature; they consist essentially of C_3 and C_4 alkanes and alkenes, or mixtures of these, and contain generally less than 0.5 % by liquid volume of material of higher carbon number, and have a vapor pressure not exceeding 2000 kPa at 40 °C.

3.1.2 *propylene concentrate*—material-containing propylene at or above concentrations of 97 % by mass.

4. Summary of Test Method

4.1 An LPG phase sample is analyzed as received via either gas or liquid sampling valves into a gas chromatograph. The gas chromatograph is provided with a liquid sampling valve and optionally with a 6-port gas sampling valve and/or a 6-port switching valve. If the user chooses to use a 6-port switching valve to provide an initial composite backflush of C_5 olefins and C_6+ components, a small length of pre-column should be used to provide separation of the components of interest, as listed in 1.1, and the heavier components. This pre-column will separate the heaviest components from the remainder of the

[1] This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.D0.03 on Propylene.

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

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

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