



Designation: D2425 – 21

Standard Test Method for Hydrocarbon Types in Middle Distillates by Mass Spectrometry¹

This standard is issued under the fixed designation D2425; 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 an analytical scheme using the mass spectrometer to determine the hydrocarbon types present in conventional and synthesized hydrocarbons that have a boiling range of 160 °C to 343 °C (320 °F to 650 °F), 5 % to 95 % by volume as determined by Test Method D86. Samples with average carbon number value of paraffins between C_{12} and C_{16} and containing paraffins from C_{10} and C_{18} can be analyzed. Eleven hydrocarbon types are determined. These include: paraffins, noncondensed cycloparaffins, condensed dicycloparaffins, condensed tricycloparaffins, alkylbenzenes, indans or tetralins, or both, C_nH_{2n-10} (indenes, etc.), naphthalenes, C_nH_{2n-14} (acenaphthenes, etc.), C_nH_{2n-16} (acenaphthylenes, etc.), and tricyclic aromatics.

NOTE 1—This test method was developed on Consolidated Electrodynamics Corporation Type 103 Mass Spectrometers. Operating parameters for users with a Quadrupole Mass Spectrometer are provided.

1.2 This test method is intended for use with full boiling range products that contain no significant olefin content.

Biodiesel (FAME components) could interfere with the separation of the sample and the characteristic mass fragments of FAME compounds are not defined in the procedure.

Hydrocarbons containing tertiary carbon fragments, sometimes found in synthetic aviation fuels, will interfere with the characteristic mass fragments of paraffins and result in a false, elevated cycloparaffin content.

NOTE 2—“No significant olefin content” for this method means <2.0 % by volume by Test Method D1319.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

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, health, and environmental practices and deter-*

mine the applicability of regulatory limitations prior to use. For a specific warning statement, see 11.1.

1.5 *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

D86 Test Method for Distillation of Petroleum Products and Liquid Fuels at Atmospheric Pressure

D1319 Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption

D2549 Test Method for Separation of Representative Aromatics and Nonaromatics Fractions of High-Boiling Oils by Elution Chromatography

D6300 Practice for Determination of Precision and Bias Data for Use in Test Methods for Petroleum Products, Liquid Fuels, and Lubricants

D6379 Test Method for Determination of Aromatic Hydrocarbon Types in Aviation Fuels and Petroleum Distillates—High Performance Liquid Chromatography Method with Refractive Index Detection

3. Terminology

3.1 Definitions:

3.1.1 *conventional hydrocarbons*, n —hydrocarbons derived from the following conventional sources: crude oil, natural gas liquid condensates, heavy oil, shale oil, and oil sands.

3.1.2 *synthesized hydrocarbons*, n —hydrocarbons derived from alternative sources such as coal, natural gas, biomass, and hydrogenated fats and oils by processes such as gasification, Fischer-Tropsch synthesis, and hydroprocessing.

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 D02.04.0M on Mass Spectrometry.

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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