



Designation: D6420 – 18

Standard Test Method for Determination of Gaseous Organic Compounds by Direct Interface Gas Chromatography-Mass Spectrometry¹

This standard is issued under the fixed designation D6420; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This test method employs a direct interface gas chromatograph/mass spectrometer (GCMS) to identify and quantify the 36 volatile organic compounds (or sub-set of these compounds) listed as follows. The individual Chemical Abstract Service (CAS) numbers are listed after each compound.

Benzene-71432	Methylene chloride-75092
Bromodichloromethane-75274	1,1,2,2-Tetrachloroethane-79349
Carbon disulfide-75150	1,1,1-Trichloroethane-71556
Chloroform-67663	1,1,2-Trichloroethane-79005
Methyl iso-Butyl ketone-108101	p-Xylene-106423
Styrene-100425	Bromomethane-74839
Tetrachloroethylene-127184	Carbon tetrachloride-56235
Toluene-108883	Chlorobenzene-108907
Bromoform-75252	c-1,3-Dichloropropene-10061015
Vinyl acetate-108054	1,2-Dichloroethane-156592
Vinyl chloride-75014	1,1-Dichloroethene-75354
Chloromethane-74873	t-1,2-Dichloroethene-156605
cis-1,2-Dichloroethene-156592	Methyl ethyl ketone-78933
Dibromochloromethane-124481	2-Hexanone-591786
1,1-Dichloroethane-107062	t-1,3-Dichloropropene-542756
1,2-Dichloropropane-78875	Trichloroethene-79016
Ethylbenzene-100414	m-Xylene-108383
Ethyl chloride-75003	o-Xylene-95476

1.2 The test method incorporates a performance-based approach, which validates each GCMS analysis by placing boundaries on the instrument response to gaseous internal standards and their specific mass spectral relative abundance. Using this approach, the test method may be extended to analyze other compounds.

1.3 The test method provides on-site analysis of extracted, unconditioned, and unsaturated (at the instrument) gas samples from stationary sources. Gas streams with high moisture content may require conditioning to prevent moisture condensation within the instrument. For these samples, quality assur-

ance (QA) requirements are provided in the test method to validate the analysis of polar, water-soluble compounds.

1.4 The instrument range should be sufficient to measure the listed volatile organic compounds from 150 ppb(v) to 100 ppm(v), using a full scan operation (between 45 and 300 atomic mass units). The range may be extended to higher or lower concentrations using either of the following procedures:

1.4.1 The initial three-point calibration concentrations and the continuing calibration checks are adjusted to match the stack concentrations, or

1.4.2 The three-point calibration is extended to include additional concentrations to cover the measurement range.

1.5 The minimum quantification level is 50 % of the lowest calibration concentration. Responses below this level are considered to be estimated concentrations, unless a calibration standard check is conducted at a lower concentration to demonstrate linearity. The sensitivity of the GCMS measurement system for the individual target analytes depends upon:

1.5.1 The specific instrument response for each target analyte and the number of mass spectral quantification ions available.

1.5.2 The amount of instrument noise, and

1.5.3 The percent moisture content of the sample gas.

1.6 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.7 *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. Additional safety precautions are described in Section 9.*

1.8 *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 D22 on Air Quality and is the direct responsibility of Subcommittee D22.03 on Ambient Atmospheres and Source Emissions.

Current edition approved Nov. 1, 2018. Published November 2018. Originally approved in 1999. Last previous edition approved in 2010 as D6420 – 99 (2010). DOI: 10.1520/D6420-18.