



Designation: D8456 – 22

Standard Test Method for Determination of Nitrosamines in Water by Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)¹

This standard is issued under the fixed designation D8456; 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 liquid chromatography tandem mass spectrometry (LC-MS/MS) detection and quantitation of N-nitrosamines after direct injection. It has been validated for groundwater, surface water, wastewater influents, and wastewater effluents. This test method is not limited to these aqueous matrices; however, the applicability of this test method to other aqueous matrices must be demonstrated.

1.2 This test method is applicable to nitrosamines that can be chromatographed and detected using a mass spectrometry procedure. [Table 1](#) lists the compounds that have been validated for this test method. This test method is not limited to the compounds listed in [Table 1](#); however, the applicability of the test method to other compounds must be demonstrated.

1.3 Analyte concentrations from 0.05 $\mu\text{g/L}$ up to approximately 5 $\mu\text{g/L}$ may be determined without dilution of the sample. Analytes with insufficient sensitivity will not be detected, but they can be measured with acceptable accuracy and precision when present in sufficient amounts. In addition, newer instruments, or instruments of improved sensitivity may be used to lower detection limits.

1.4 Analytes that are not separated chromatographically, but that have different mass spectra and noninterfering quantitation ions, can be identified and measured in the same calibration mixture or water sample. Analytes that have very similar product ions cannot be individually identified and measured in the same calibration mixture or water sample unless they have different retention times.

1.5 It is the responsibility of the user to ensure the validity of this test method for untested matrices.

1.6 This test method is restricted to use by or under the supervision of analysts experienced in the use of a liquid chromatograph with tandem mass spectrometry (LC-MS/MS).

1.7 Depending on data usage, you may modify this test method but limit to modifications that improve performance

while still meeting method quality acceptance criteria. Shortening the chromatographic run simply to save time is not allowed. Use Practice [E2935](#) or similar statistical tests to confirm that modifications produce equivalent results on non-interfering samples. In addition, use Guide [E2857](#) or equivalent statistics to re-validate the modified test.

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

1.9 *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.*

1.10 *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

- [D1129 Terminology Relating to Water](#)
- [D1193 Specification for Reagent Water](#)
- [D2777 Practice for Determination of Precision and Bias of Applicable Test Methods of Committee D19 on Water](#)
- [D3370 Practices for Sampling Water from Flowing Process Streams](#)
- [D4448 Guide for Sampling Ground-Water Monitoring Wells](#)
- [D6089 Guide for Documenting a Groundwater Sampling Event](#)
- [D6538 Guide for Sampling Wastewater With Automatic Samplers](#)
- [D6759 Practice for Sampling Liquids Using Grab and Discrete Depth Samplers](#)
- [E2857 Guide for Validating Analytical Methods](#)

¹ This test method is under the jurisdiction of ASTM Committee [D19](#) on Water and is the direct responsibility of Subcommittee [D19.06](#) on Methods for Analysis for Organic Substances in Water.

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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.