



Standard Test Method for Determination of Aldicarb, Carbofuran, Oxamyl and Methomyl by Liquid Chromatography/Tandem Mass Spectrometry¹

This standard is issued under the fixed designation D7600; 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 procedure covers the determination of aldicarb, carbofuran, oxamyl and methomyl (referred to collectively as carbamates in this test method) in surface water by direct injection using liquid chromatography (LC) and detected with tandem mass spectrometry (MS/MS). These analytes are qualitatively and quantitatively determined by this test method. This test method adheres to multiple reaction monitoring (MRM) mass spectrometry.

1.2 This test method has been developed by US EPA Region 5 Chicago Regional Laboratory (CRL).

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

1.4 The Detection Verification Level (DVL) and Reporting Range for the carbamates are listed in [Table 1](#).

1.4.1 The DVL is required to be at a concentration at least 3 times below the Reporting Limit (RL) and have a signal/noise ratio greater than 3:1. [Fig. 1](#) displays the signal/noise ratios of the primary single reaction monitoring (SRM) transitions and [Fig. 2](#) displays the confirmatory SRM transitions at the DVLs for the carbamates.

1.4.2 The reporting limit is the concentration of the Level 1 calibration standard as shown in [Table 2](#) for the carbamates.

1.5 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

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](#)
 - [D3856 Guide for Management Systems in Laboratories Engaged in Analysis of Water](#)
 - [D3694 Practices for Preparation of Sample Containers and for Preservation of Organic Constituents](#)
 - [D5847 Practice for Writing Quality Control Specifications for Standard Test Methods for Water Analysis](#)
 - [E2554 Practice for Estimating and Monitoring the Uncertainty of Test Results of a Test Method Using Control Chart Techniques](#)
- ### 2.2 Other Documents:³
- [EPA publication SW-846 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods](#)

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in this standard, refer to Terminology [D1129](#).

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *detection verification level, DVL, n*—a concentration that has a signal/noise ratio greater than 3:1 and is at least 3 times below the reporting limit (RL).

3.2.2 *carbamates, n*—in this test method, aldicarb, carbofuran, oxamyl and methomyl collectively.

3.2.3 *independent reference material, IRM, n*—a material of known purity and concentration obtained either from the

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.

Current edition approved Feb. 1, 2016. Published May 2016. Originally approved in 2009. Last previous edition approved in 2009 as D7600 – 09^{ε3}. DOI: 10.1520/D7600-16.

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.

³ Available from National Technical Information Service (NTIS), U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA, 22161 or at <http://www.epa.gov/epawaste/hazard/testmethods/index.htm>.