

ASTM D7600 - 09e3 Standard Test Method for Determination of Aldicarb, Carbofuran, Oxamyl and Methomyl by Liquid Chromatography/Tandem Mass Spectrometry

Instrument: [Waters Micromass LCT Premier Mass Spectrometer LC/MS System](#)

Significance and Use

5.1 The *N*-methyl carbamate (NMC) pesticides: aldicarb, carbaryl, carbofuran, formetanate hydrochloride, methiocarb, methomyl, oxamyl, pirimicarb, propoxur, and thiodicarb have been identified by EPA as working through a common mechanism. They affect the nervous system by reducing the ability of the enzyme cholinesterase. Cholinesterase inhibition was the primary toxicological effect of regulatory concern to EPA in assessing the NMC's food, drinking water and residential risks. In most of the country, NMC residues in drinking water sources are at levels that are not likely to contribute substantially to the multi-pathway cumulative exposure. Shallow private wells extending through highly permeable soils into shallow, acidic ground water represent what the EPA believes to be the most vulnerable drinking water.⁴

5.2 This method has been investigated for use with reagent and surface water for the selected carbamates: aldicarb, carbofuran, oxamyl and methomyl.

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 method. This 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 (*purchase separately*)

ASTM Standards

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

D3694 Practices for Preparation of Sample Containers and for Preservation of Organic Constituents

D3856 Guide for Management Systems in Laboratories Engaged in Analysis of Water

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 in a Single Laboratory Using a Control Sample Program

<http://www.astm.org/Standards/D7600.htm>