



Designation: D7731 – 17 (Reapproved 2024)

Standard Test Method for Determination of Dipropylene Glycol Monobutyl Ether and Ethylene Glycol Monobutyl Ether in Sea Water by Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)¹

This standard is issued under the fixed designation D7731; 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 determination of dipropylene glycol monobutyl ether (DPGBE) and ethylene glycol monobutyl ether (EGBE) in sea water by direct injection using liquid chromatography (LC) and detection with tandem mass spectrometry (MS/MS). These analytes are qualitatively and quantitatively determined by this test method. This test method adheres to selected reaction monitoring (SRM) mass spectrometry.

1.2 The detection verification level (DVL) and reporting range for DPGBE and EGBE are listed in [Table 1](#).

1.2.1 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](#) and [Fig. 2](#) display the signal/noise ratio of the single reaction monitoring (SRM) transition.

1.2.2 The reporting limit is the concentration of the Level 1 calibration standard as shown in [Table 4](#) for DPGBE and EGBE, taking into account the 20 % sample preparation dilution factor.

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 *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.*

1.5 *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

[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](#)

2.2 *Other Standards:*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 *reporting limit, RL, n*—the concentration of the lowest-level calibration standard used for quantification.

3.2.2.1 *Discussion*—In this test method, a 20 mL sample aliquot is diluted to a 25 mL final volume after thoroughly rinsing the collection vial with acetonitrile for quantitative transfer. In this case, the lowest calibration level of 100 ppb for EGBE would allow for a reporting limit of 125 ppb to be achieved.

3.3 *Abbreviations:*

3.3.1 *mM*—millimolar, 1×10^{-3} moles/L

3.3.2 *NA*—no addition

3.3.3 *ND*—non-detect

3.3.4 *ppb*—parts per billion, $\mu\text{g/L}$

3.3.5 *ppt*—parts per trillion, ng/L

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.

³ Available from National Technical Information Service (NTIS), 5301 Shawnee Rd., Alexandria, VA 22312, <http://www.ntis.gov>.