



Standard Test Method for Determination of Thiodiglycol on Wipes by Solvent Extraction Followed by Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)¹

This standard is issued under the fixed designation E2838; 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 details the determination of thiodiglycol (TDG), also known as 2,2'-thiobis-ethanol, on wipes with 3,3'-thiodipropanol (TDP) as the surrogate. This method is based upon solvent extraction of wipes by either sonication or a pressurized fluid extraction (PFE) technique as an alternative option. The extract is filtered, concentrated and analyzed by liquid chromatography/tandem mass spectrometry (LC/MS/MS). TDG is qualitatively and quantitatively determined.

1.2 *Units*—The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 The Method Detection Limit (MDL)² and Reporting Range³ for TDG are listed in [Table 1](#).

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

2. Referenced Documents

2.1 ASTM Standards:⁴

[D653 Terminology Relating to Soil, Rock, and Contained Fluids](#)

¹ This test method is under the jurisdiction of ASTM Committee E54 on Homeland Security Applications and is the direct responsibility of Subcommittee E54.03 on Decontamination.

Current edition approved June 1, 2016. Published July 2016. Originally approved in 2011. Last previous edition approved in 2011 as E2838 – 11. DOI: 10.1520/E2838-11R16.

² The MDL is determined following the Code of Federal Regulations, 40 CFR Part 136, Appendix B utilizing solvent extraction of wipes by sonication.

³ Reporting range concentrations are calculated from [Table 4](#) concentrations assuming a 10 µL injection of the lowest and highest level calibration standards with a 2 mL final extract volume. Volume variations will change the reporting limit and ranges. The reporting limit (RL), lowest concentration of the reporting range, is calculated from the concentration of the Level 1 calibration standard as shown in [Table 4](#).

⁴ 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.

[D1193 Specification for Reagent Water](#)

[D3694 Practices for Preparation of Sample Containers and for Preservation of Organic Constituents](#)

[D3740 Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction](#)

[E2554 Practice for Estimating and Monitoring the Uncertainty of Test Results of a Test Method Using Control Chart Techniques](#)

2.2 Other Documents:

[EPA Publication SW-846 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods](#)⁵

[The Code of Federal Regulations, 40 CFR Part 136, Appendix B](#)

3. Terminology

3.1 Abbreviations:

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

3.1.2 *ND*—non-detect

3.1.3 *SRM*—single reaction monitoring

3.1.4 *MRM*—multiple reaction monitoring

3.1.5 *VOA*—volatile organic analysis

4. Summary of Test Method

4.1 For TDG wipe analysis, samples are shipped to the lab between 0°C and 6°C. The samples are to be extracted, concentrated, and analyzed directly by LC/MS/MS within 7 days of collection. The handling, storage, preservation, and LC/MS/MS analysis are consistent between the two extraction procedures described in this test method. Only one extraction procedure is required, documenting which was performed.

4.2 TDG and TDP are identified by retention time and one SRM transition. The target analyte and surrogate are quantitated using the SRM transitions utilizing an external calibration. The final report issued for each sample lists the concentration of TDG and the TDP recovery.

⁵ 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>