



Designation: D4978 – 16 (Reapproved 2025)

Standard Test Methods for Screening of Reactive Sulfides in Waste¹

This standard is issued under the fixed designation D4978; 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 These test methods are applicable to the screening of reactive sulfides in wastes, liquids, sludges, semisolids, and solids by using the following methods:

Test Method A—Lead Acetate Paper	Sections
Test Method B—Gas Detector Tube	9 – 14
	15 – 19

1.2 These test methods are not applicable in determining the type and concentration of reactive sulfides.

1.3 These test methods are designed and intended as a preliminary test to complement the more sophisticated quantitative analytical techniques that may be used to determine sulfide concentration. These test methods offer to the user the option and the ability to screen waste for potentially hazardous levels of reactive sulfide when the sophisticated techniques are not available and the total waste composition is unknown.

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. Specific hazard information is given in Section 7 and 11.3.*

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

D1193 Specification for Reagent Water

¹ These test methods are under the jurisdiction of ASTM Committee D34 on Waste Management and are the direct responsibility of Subcommittee D34.01.05 on Screening Methods.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *reactive sulfide*—a compound containing sulfide that readily forms hydrogen sulfide gas upon reaction with acid.

3.1.2 *screening analysis*—a *preliminary* qualitative or semi-quantitative test developed from classical qualitative and quantitative techniques that is designed to efficiently give the user parameters about a waste that will aid in determining waste identification, process compatibility, and safety in handling.

4. Summary of Test Methods

4.1 *Method A: Lead Acetate Paper*—A sample of waste material is acidified. If sulfides are present in the waste, hydrogen sulfide (H_2S) is evolved. In the presence of hydrogen sulfide, lead acetate paper changes color to silvery brown or black.

4.2 *Method B: Gas Detector Tube*—A portion of the sample is acidified in a beaker to release sulfide as hydrogen sulfide gas. The gas is funneled through a detector tube creating a color stain in the tube proportionate to the concentration of sulfide gas in the vapor. A definite color change in the detector tube indicates a positive presence of sulfide.

5. Significance and Use

5.1 These test methods are intended for use by waste treatment, storage, disposal, and remedial facilities in order to show the presence of potentially hazardous sulfide.

5.2 *Method B: Gas Detector Tube*—This proposed test method was designed to measure gases migrating into an air space at a height of ten units (for example, 10 ft) from a receiving or mixing pit of ten units square (for example, 100 ft²). In essence, the total volume of the atmosphere is approximately ten times the surface area of the sample and test solution.

6. Reagents

6.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society where