

Designation: D 993 – 58 (Reapproved 1982)¹

Standard Test Methods for SULFATE-REDUCING BACTERIA IN WATER AND WATER- FORMED DEPOSITS¹

This standard is issued under the fixed designation D 993; 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 NOTE—Editorial changes were made throughout including the addition of new Section 3 and subsequent renumbering of sections.

1. Scope

1.1 These methods cover the detection of the presence of sulfate-reducing bacteria when present in deposits or water samples and the estimation of the number of bacteria present. Two methods are given, as follows:

	Sections
Method A	7 to 13
Method B	14 to 20

1.2 Method A covers the preferred procedure for the detection and estimation of sulfate-reducing bacteria in water samples. Method B covers a procedure of greater simplicity and lesser precision than method A.

2. Applicable Documents

2.1 ASTM Standards:

D 887 Practice for Field Sampling of Water-Formed Deposits²

D 1129 Definitions of Terms Relating to Water³

D 1193 Specification for Reagent Water³

D 3370 Practices for Sampling Water³

2.2 *Standard Methods for the Examination of Water and Wastewater*, Fourteenth Edition⁴

3. Significance

3.1 Sulfate-reducing bacteria are microorganisms capable of reducing sulfate, or other forms of oxidized sulfur, to hydrogen sulfide. This reaction takes place only under anaerobic conditions; thus, the bacteria may be found in quantity in anaerobic deep wells, lake or marsh bottoms, reservoir bottoms, in the soil, and beneath deposits or other bacterial growth in

aerated systems. Their proliferation and the amount of hydrogen sulfide produced depend upon the sulfate concentration. Because of the production of hydrogen sulfide, these bacteria cause corrosion of metals and deposition problems.

4. Terminology

4.1 For definitions of terms used in this method, refer to Definitions D 1129.

5. Purity of Reagents

5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.⁵ Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination. The suitability of the chemicals shall be checked by incorporating them in a culture medium and testing for typical growth of a known culture of sulfate-reducing bacteria.

¹ These methods are under the jurisdiction of ASTM Committee D-19 on Water.

Current edition effective Sept. 22, 1958. Originally issued 1948. Replaces D 993 – 51.

² *Annual Book of ASTM Standards*, Vol 11.02.

³ *Annual Book of ASTM Standards*, Vol 11.01.

⁴ Available from American Public Health Assoc., 1015 18th St., N. W., Washington, D. C. 20036.

⁵ "Reagent Chemicals, American Chemical Society Specifications," Am. Chemical Soc., Washington, D.C. For suggestions on the testing of reagents not listed by the American Chemical Society, see "Reagent Chemicals and Standards," by Joseph Rosin, D. Van Nostrand Co., Inc., New York, N.Y., and the "United States Pharmacopeia."