



Standard Test Method for Thiocyanate in Water¹

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1. Scope

1.1 This test method covers the determination of dissolved thiocyanate in water, waste water, and saline water in the range from 0.1 to 2.0 mg/L. For higher concentrations, use an aliquot from the diluted sample.

1.2 This test method has been used successfully with reagent grade, natural, and treated sanitary effluent waters. It is the user's responsibility to assure the validity of the test method on any untested matrices.

1.3 *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.* For specific hazards, see Section 9.

2. Referenced Documents

2.1 ASTM Standards:

- D 1129 Terminology Relating to Water²
- D 1192 Guide for Equipment for Sampling Water and Steam in Closed Conduits²
- D 1193 Specification for Reagent Water²
- D 2036 Test Methods for Cyanides in Water³
- D 3370 Practices for Sampling Water from Closed Conduits²
- D 3856 Guide for Good Laboratory Practices in Laboratories Engaged in Sampling and Analysis of Water²
- D 4210 Practice for Interlaboratory Quality Control Procedures and a Discussion on Reporting Low-Level Data²
- D 5788 Guide for Spiking Organics into Aqueous Samples³
- D 5789 Practice for Writing Quality Control Specifications for Standard Test Methods for Organic Constituents³
- D 5847 Practice for Writing Quality Control Specifications for Standard Test Methods for Water Analysis³

E 60 Practice for Molecular Absorption Spectrometric Methods for Chemical Analysis of Metals, Ores, and Related Materials⁴

E 275 Practice for Describing and Measuring Performance of Ultraviolet, Visible, and Near-Infrared Spectrophotometers⁵

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology D 1129.

4. Summary of Test Method

4.1 Thiocyanate reacts with ferric ions at a pH of < 2 to form a colored complex which is determined colorimetrically at 460 nm and adheres to Beer's Law.

4.2 Industrial wastes may be highly colored and contain various interfering organic compounds which must be removed by adsorption on macroreticular resin⁶ prior to analysis.

5. Significance and Use

5.1 Many natural waters contain thiocyanate from organic decomposition products and waste water discharges. Some industrial wastes, such as those from the steel industry, petroleum refining, and coal gasification, may contain significant concentrations of thiocyanate. Thiocyanate per se is not recognized as a toxic chemical compound. However, when chlorinated, thiocyanate is converted to the highly toxic and volatile cyanogen chloride.

5.1.1 For information on the impact of cyanogen compounds, see Appendix X1 of Test Method D 2036.

6. Interferences

6.1 Hexavalent chromium interference is removed by adjusting the pH to 2 with concentrated nitric acid and adding ferrous sulfate. Raising the pH to 8.5-9 with sodium hydroxide

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 *Annual Book of ASTM Standards*, Vol 11.01.

³ *Annual Book of ASTM Standards*, Vol 11.02.

⁴ *Annual Book of ASTM Standards*, Vol 03.05.

⁵ *Annual Book of ASTM Standards*, Vol 03.06.

⁶ Spencer, R. R., Leenheer, J., and Marti, V. C., "Automated Colorimetric Determination of Thiocyanate, Thiosulfate, and Tetrathionate in Water," AOAC 94th Annual Meeting, Washington, DC, 1980.