



Standard Test Method for Cyanogen Chloride in Water¹

This standard is issued under the fixed designation D4165; 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 cyanogen chloride in water. Cyanogen chloride is normally present only at very low concentrations; it is a very labile and sparsely soluble gaseous compound. Water samples may contain cyanogen chloride after the chlorination of waste waters containing cyanide or thiocyanate compounds.

1.2 Cyanogen chloride is unstable. A quick test using a spot plate or comparator as soon as the sample is collected may be the best test, reducing the loss of cyanogen chloride during the time lapse between sampling and analysis. (See Fig. 1 for a typical decay curve for cyanogen chloride in a solution.)

1.3 This test method has been used successfully with reagent water. The analyst is responsible for determining whether the test method is applicable to the water matrix being tested. Reference is made to Test Method D of Test Methods D2036 which is based on similar chemical reactions and has been evaluated by collaborative testing in this matrix.

1.4 The lower limit of detectability is 0.005 mg CN⁻/L.

1.5 *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.* Specific hazard statements are given in Note 1 and Note 2 and Section 9.

2. Referenced Documents

2.1 ASTM Standards:²

D1129 Terminology Relating to Water

D1193 Specification for Reagent Water

D2036 Test Methods for Cyanides in Water

D3370 Practices for Sampling Water from Closed Conduits

D3856 Guide for Management Systems in Laboratories Engaged in Analysis of Water

D4210 Practice for Intralaboratory Quality Control Procedures and a Discussion on Reporting Low-Level Data (Withdrawn 2002)³

D5789 Practice for Writing Quality Control Specifications for Standard Test Methods for Organic Constituents (Withdrawn 2002)³

D5847 Practice for Writing Quality Control Specifications for Standard Test Methods for Water Analysis

E60 Practice for Analysis of Metals, Ores, and Related Materials by Spectrophotometry

E275 Practice for Describing and Measuring Performance of Ultraviolet and Visible Spectrophotometers

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology D1129.

4. Summary of Test Method

4.1 The water sample is mixed with a pyridine-barbituric acid solution and the color produced is measured with a spectrophotometer.

5. Significance and Use

5.1 The presence of cyanogen chloride in chlorinated sanitary and industrial effluents and therefore receiving waters is of concern because of its toxicity to aquatic life.

5.2 This test method provides an analytical procedure for measuring cyanogen chloride in water.

5.3 This test method is applicable for clean metal finishing and chlorinated sanitary and industrial effluents, and also can be used to establish process control of cyanide destruction by chlorination in waste water treatment facilities.

6. Interferences

6.1 Color and turbidity can interfere.

7. Apparatus

7.1 *Spectrophotometer or Filter Photometer*, suitable for measurement in the region of 578 nm, using 1.0-cm absorption

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 The last approved version of this historical standard is referenced on www.astm.org.