



Designation: D5049 – 23

Standard Practice for Screening of Cyanides in Waste¹

This standard is issued under the fixed designation D5049; 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 practice is applicable to the screening of cyanides in waste liquids, sludges, semisolids, and solids. The following screening methods are included:

	Sections
Method A—Chloramine T	13 – 15
Method B—Prussian Blue	16 – 18
Method C—Cyanide Test Paper	19 – 21
Method D—Gas Detector Tube	22 – 26
Method E—Ion Selective Electrode	27 – 31

1.2 This practice is designed and intended as a compilation of screening tests to complement more sophisticated quantitative analytical techniques that may be used to determine cyanide concentration. This practice provides the user the option and the ability to “screen” waste for potentially hazardous levels of cyanide when the more sophisticated techniques are not available and the total waste composition is unknown.

1.3 The values stated in SI units are to be regarded as the standard.

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 8 and 18.5.

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 This practice is under the jurisdiction of ASTM Committee D34 on Waste Management and is the direct responsibility of D34.01 on Monitoring and Characterization.

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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.

D2036 Test Methods for Cyanides in Water

D5681 Terminology for Waste and Waste Management

D6696 Guide for Understanding Cyanide Species

D7365 Practice for Sampling, Preservation and Mitigating Interferences in Water Samples for Analysis of Cyanide

D8273 Practice for Determination of Total and Available Cyanide in Solid Waste and Soil after Alkaline Extraction

E200 Practice for Preparation, Standardization, and Storage of Standard and Reagent Solutions for Chemical Analysis

2.2 *Code of Federal Regulations:*³

21 CFR Part 1308 Schedules of Controlled Substances

3. Terminology

3.1 See Terminology D5681 for definitions of terms related to waste and waste management.

3.2 See Guide D6696 for terminology specific to the various forms of cyanide.

3.3 *Definitions of Terms Specific to This Standard:*

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

4. Summary of Screening Methods

4.1 *Method A, Chloramine-T Method*—The presence of cyanides can be observed when cyanides react with chloramine-T reagent at pH 8 to form cyanogen chloride. The addition of barbituric acid to cyanogen chloride gives intensive red color. This method indicates cyanides amenable to chlorination.

4.2 *Method B, Prussian Blue Method*—The pH of a sample is adjusted to pH 12 with NaOH and subsequently, solutions of ferrous sulfate and ferric chloride are added. By the addition of concentrated sulfuric acid in the presence of cyanides, a deep blue color (Prussian blue) is produced. This method indicates the presence of free cyanide and many complex cyanides.

³ Code of Federal Regulations available from the Superintendent of Documents, United States Government Printing Office, Washington, DC 20402.