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.

Designation: D7511 – 12 (Reapproved 2017)$^{\varepsilon 1}$

Standard Test Method for Total Cyanide by Segmented Flow Injection Analysis, In-Line Ultraviolet Digestion and Amperometric Detection[1]

This standard is issued under the fixed designation D7511; 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.

ε^1 NOTE—Warning notes were editorially updated throughout in July 2017.

1. Scope

1.1 This test method is used for determining total cyanide in drinking and surface waters, as well as domestic and industrial wastes. Cyanide ion (CN^-), hydrogen cyanide in water (HCN(aq)), and the cyano-complexes of zinc, copper, cadmium, mercury, nickel, silver, and iron may be determined by this test method. Cyanide ions from Au(I), Co(III), Pd(II), and Ru(II) complexes are only partially determined.

1.2 The method detection limit (MDL) is 1.0 µg/L cyanide and the minimum level (ML) is 3 µg/L. The applicable range of the method is 3 to 500 µg/L cyanide using a 200-µL sample loop. Extend the range to analyze higher concentrations by sample dilution or changing the sample loop volume.

1.3 This test method can be used by analysts experienced with equipment using segmented flow analysis (SFA) and flow injection analysis (FIA) or working under the close supervision of such qualified persons.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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 8.5 and Section 9.

1.6 *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]

D1129 Terminology Relating to Water
D1193 Specification for Reagent Water
D2036 Test Methods for Cyanides in Water
D2777 Practice for Determination of Precision and Bias of Applicable Test Methods of Committee D19 on 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]
D5847 Practice for Writing Quality Control Specifications for Standard Test Methods for Water Analysis
D6696 Guide for Understanding Cyanide Species
D7365 Practice for Sampling, Preservation and Mitigating Interferences in Water Samples for Analysis of Cyanide

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this standard, refer to Terminology D1129 and Guide D6696.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *total cyanide, n*—refers to all cyanide-containing compounds in a sample, including free cyanide, WAD cyanide compounds, and strong metal cyanide complexes.

4. Summary of Test Method

4.1 Prior to analysis, treat the sample to remove potential interferences (Sections 4 and 8). Ultraviolet (UV) digestion releases cyanide from cyanide complexes. Acid addition converts cyanide ion to hydrogen cyanide gas (HCN), which passes under a gas diffusion membrane. The hydrogen cyanide

[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.

Current edition approved July 1, 2017. Published July 2017. Originally approved in 2009. Last previous edition approved in 2012 as D7511 – 12. DOI: 10.1520/D7511-12R17E01.

[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.

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