



Standard Test Methods for Nickel in Water¹

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1. Scope*

1.1 These test methods^{2, 3, 4} cover the atomic absorption determination of nickel in water and wastewaters. Three test methods are given as follows:

	Concentration Range	Sections
Test Method A—Atomic Absorption, Direct	0.1 to 10 mg/L	7 – 16
Test Method B—Atomic Absorption, Chelation-Extraction	10 to 1000 μ g/L	17 – 26
Test Method C—Atomic Absorption, Graphite Furnace	5 to 100 μ g/L	27 – 36

1.2 Test Methods A, B, and C have been used successfully with reagent grade water and natural waters. Evaluation of Test Method C was also made in condensate from a medium Btu coal gasification process. It is the user's responsibility to ensure the validity of these test methods for other matrices.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses are mathematical conversion to inch-pound units that are provided for information only and are not considered 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 and health practices and determine the applicability of regulatory limitations prior to use.* For specific hazards statements, see [Note 5, 11.8.1, 21.11, 23.7, and 23.10](#).

1.5 Two former colorimetric test methods were discontinued. Refer to [Appendix X1](#) for historical information.

2. Referenced Documents

2.1 ASTM Standards:⁵

[D858 Test Methods for Manganese in Water](#)
[D1066 Practice for Sampling Steam](#)
[D1068 Test Methods for Iron in Water](#)
[D1129 Terminology Relating to Water](#)
[D1193 Specification for Reagent Water](#)
[D1687 Test Methods for Chromium in Water](#)
[D1688 Test Methods for Copper in Water](#)
[D1691 Test Methods for Zinc 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](#)
[D3557 Test Methods for Cadmium in Water](#)
[D3558 Test Methods for Cobalt in Water](#)
[D3559 Test Methods for Lead in Water](#)
[D3919 Practice for Measuring Trace Elements in Water by Graphite Furnace Atomic Absorption Spectrophotometry](#)
[D4841 Practice for Estimation of Holding Time for Water Samples Containing Organic and Inorganic Constituents](#)
[D5673 Test Method for Elements in Water by Inductively Coupled Plasma—Mass Spectrometry](#)
[D5810 Guide for Spiking into Aqueous Samples](#)
[D5847 Practice for Writing Quality Control Specifications for Standard Test Methods for Water Analysis](#)

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in these test methods, refer to Terminology [D1129](#).

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *total recoverable nickel, n*—a descriptive term relating to the nickel forms recovered in the acid-digestion procedure specified in these test methods.

¹ These test methods are under the jurisdiction of ASTM Committee D19 on Water and are the direct responsibility of Subcommittee D19.05 on Inorganic Constituents in Water.

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² Chilton, J. M., "Simultaneous Colorimetric Determination of Copper, Cobalt, and Nickel as Diethyldithiocarbamates," *Analytical Chemistry*, Vol 25, 1953, pp. 1274–1275.

³ Platte, J. A., and Marcy, V. M., "A New Tool for the Water Chemist," *Industrial Water Engineering*, May 1965.

⁴ Brown, E., Skougstad, M. W., and Fishman, M. J., "Methods for Collection and Analysis of Water Samples for Dissolved Minerals and Gases," *Techniques of Water-Resources Investigations of the U.S. Geological Survey*, Book 5, 1970, p. 115.

⁵ 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.