



Designation: D6800 – 18

Standard Practice for Preparation of Water Samples Using Reductive Precipitation Preconcentration Technique for ICP-MS Analysis of Trace Metals¹

This standard is issued under the fixed designation D6800; 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 Toxic elements may be present in ambient waters and may enter the food chain via uptake by plants and animals; the actual concentrations of toxic metals are usually sub-ng/mL. The U.S. EPA has published its Water Quality Standards in the U.S. Federal Register 40 CFR 131.36, Minimum requirements for water quality standards submission, Ch. I (7-1-00 Edition), see Annex, [Table A1.1](#). The U.S. EPA has also developed Method 1640 to meet these requirements, see Annex, [Table A1.2](#).

1.2 Inductively Coupled Plasma Mass Spectroscopy (ICP-MS) is a technique with sufficient sensitivity to routinely measure toxic elements in ambient waters, both fresh and saline (Test Method [D5673](#)). However saline and hard water matrices pose analytical challenges for direct multielement analysis by ICP-MS at the required sub-ng/mL levels.

1.3 This practice describes a method used to prepare water samples for subsequent multielement analysis using ICP-MS. The practice is applicable to seawater and fresh water matrices, which may be filtered or digested. Samples prepared by this method have been analyzed by ICP-MS for the elements listed in Annex, [Table A1.3](#)).

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

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](#)
[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](#)

2.2 Other Documents:

[U.S. Federal Register 40 CFR 131.36, Minimum Requirements for Water Quality Standards Submission, Ch. I \(7-1-00 Edition\)](#)³
[U.S. EPA Method 1640, Determination of Trace Elements in Water by Preconcentration and Inductively Coupled Plasma-Mass Spectrometry \(1997\)](#)⁴
[U.S. EPA Method 1669, Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels](#)⁴

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in this standard, refer to Terminology [D1129](#).

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *continuing calibration blank, n*—a solution containing no analytes (of interest) which is used to verify blank response and freedom from carryover.

¹ This practice is under the jurisdiction of ASTM Committee [D19](#) on Water and is the direct responsibility of Subcommittee [D19.05](#) on Inorganic Constituents 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 Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, <http://quicksearch.dla.mil>.

⁴ Available from United States Environmental Protection Agency (EPA), William Jefferson Clinton Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20460, <http://www.epa.gov>.

*A Summary of Changes section appears at the end of this standard