



Designation: D4698 – 21

Standard Practice for Total Digestion of Sediment Samples for Chemical Analysis of Various Metals¹

This standard is issued under the fixed designation D4698; 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 covers two procedures for the total digestion of sediments for subsequent determination of metals by such techniques as flame atomic absorption spectrophotometry, graphite-furnace atomic absorption spectrophotometry, atomic emission spectroscopy, etc.

1.2 This practice is applicable in the subsequent determination of volatile, semivolatile, and nonvolatile metals of sediments.

1.3 Actual metal quantitation can be accomplished by following the various test methods outlined under other appropriate ASTM standards for the metal(s) of interest. Before selecting either of the digestion techniques outlined in this practice, the user should consult the appropriate quantitation standard(s) for any special analytical considerations, and Practice D3976 for any special preparatory considerations.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered 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.* For a specific hazard statement, see 15.5.

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
D1192 Guide for Equipment for Sampling Water and Steam in Closed Conduits (Withdrawn 2003)³
D1193 Specification for Reagent Water
D3976 Practice for Preparation of Sediment Samples for Chemical Analysis

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 *partial digestion, n*—the dissolution of a sediment matrix such that quantitation will produce a measurement of less than 95 % of the constituent present in the sample. In such cases, recovery is operationally defined by the digestion procedure.

3.2.2 *total digestion, n*—the dissolution of a sediment matrix such that quantitation will produce a measurement which is more than 95 % of the constituent present in the sample.

4. Summary of Practice

4.1 Many procedures are available for the total digestion of sediments prior to metal analysis, but almost all the methods fall into one of two main classes: fusion and subsequent dissolution of the bead, and wet digestion which directly dissolves the sample with mineral acids. Each of the classes has advantages and disadvantages, as do the individual procedures which fall under them. The two procedures outlined in this practice were selected because they are the least restricted, in terms of utility, for dealing with a wide variety of matrices. Before choosing a particular method, the user should consult the pertinent literature to determine the utility and applicability

¹ This practice is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.07 on Sediments, Geomorphology, and Open-Channel Flow.

Current edition approved Nov. 1, 2021. Published January 2022. Originally approved in 1987. Last previous edition approved in 2013 as D4698 – 92 (2013). DOI: 10.1520/D4698-21.

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.