



Designation: D 5074 – 90 (Reapproved 1999)

Standard Practice for Preparation of Natural-Matrix Sediment Reference Samples for Major and Trace Inorganic Constituents Analysis by Partial Extraction Procedures¹

This standard is issued under the fixed designation D 5074; 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 establishes uniform procedures to develop, select, collect, prepare, and use oxidized, relatively unpolluted, aquatic natural-matrix bed-sediment reference samples for the collaborative testing of chemical methods of analysis for sediments and similar materials. Reference samples prepared using this practice are intended for use as natural sediments, analyzable for major, minor, and trace elements, and general physical/organic analyses only. The samples are not designed or tested for environmental pollutants such as trace organic compounds.

1.2 Few, if any, aquatic sediment reference materials have been certified, defined, or are even available for developing or evaluating partial and sequential extraction procedures. This practice describes factors and considerations in site selection, sample characteristics, collection, and subsequent raw sample treatment needed to prepare natural-matrix bed-material sediments for use as partial or sequential extraction procedure reference test samples. The user of this practice is cautioned that in light of the many variables that may affect natural materials, neither the list of factors included for evaluation nor preparation of natural-matrix reference samples should be considered as all inclusive. It is the user's responsibility to ensure the validity and applicability of these practices for preparing specific-matrix samples appropriate for testing the constituents of interest and the operationally defined extraction procedures utilized.

1.3 *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.*

2. Referenced Documents

2.1 ASTM Standards:

D 1129 Terminology Relating to Water²

¹ This practice is under the jurisdiction of ASTM Committee D-19 on Water and is the direct responsibility of Subcommittee D19.07 on Sediments, Geomorphology, and Open-Channel Flow.

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² *Annual Book of ASTM Standards*, Vol 11.01.

D 3974 Practices for Extraction of Trace Elements from Sediments³

D 3975 Practice for Development and Use (Preparation) of Samples for Collaborative Testing of Methods for Analysis of Sediments³

D 3976 Practice for Preparation of Sediment Samples for Chemical Analysis³

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁴

3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, refer to Terminology D 1129.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *natural-matrix sediment*—granular rock or earthy material that has been naturally deposited in or by a water body, in which the finer grained material encloses or fills the interstices between the larger grains or particles of sediment.

4. Summary of Practice

4.1 Natural-matrix sediment reference samples of adequately defined composition and homogeneity are required for evaluating the accuracy and precision of partial or sequential sediment leachate analyses and test methods. Reference samples should be typical in all respects to the sample for which the test method is applicable. Practically, this is difficult to achieve because of the heterogeneity and compositional variability of natural sediments. However, natural sediments collected from diverse sources can be used to prepare reference samples similar or typical in many respects to the samples for which the test methods are to be applicable. For a minimal sediment quality assurance testing effort, and to evaluate the linearity of test methods, reference samples should be available to provide at least three levels of concentration for each measured parameter. Mixtures of samples of known composition may also be used.

5. Significance and Use

5.1 The objective of this practice is to provide guidelines for the preparation of stable, representative, oxidized, relatively

³ *Annual Book of ASTM Standards*, Vol 11.02.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.