Designation: D 5744 – 96 (Reapproved 2001)

Standard Test Method for Accelerated Weathering of Solid Materials Using a Modified Humidity Cell[1]

This standard is issued under the fixed designation D 5744; 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 test method covers a procedure that accelerates the natural weathering rate of a solid material sample so that diagnostic weathering products can be produced, collected, and quantified. Soluble weathering products are mobilized by a fixed-volume aqueous leach that is performed, collected, and analyzed weekly. When conducted in accordance with the following protocol, this laboratory test method has accelerated metal-mine waste-rock weathering rates by at least an order of magnitude greater than observed field rates **(1)**.[2]

1.1.1 This test method is intended for use to meet kinetic testing regulatory requirements for mining waste and ores.

1.2 This test method is a modification of an accelerated weathering test method developed originally for mining wastes **(2-4)**. However, it may have useful application wherever gaseous oxidation coupled with aqueous leaching are important mechanisms for contaminant mobility.

1.3 This test method calls for the weekly leaching of a 1000-g solid material sample, with water of a specified purity, and the collection and chemical characterization of the resulting leachate over a minimum period of 20 weeks.

1.4 As described, this test method may not be suitable for some materials containing plastics, polymers, or refined metals. These materials may be resistant to traditional particle size reduction methods.

1.5 Additionally, this test method has not been tested for applicability to organic substances and volatile matter.

1.6 This test method is not intended to provide leachates that are identical to the actual leachate produced from a solid material in the field or to produce leachates to be used as the sole basis of engineering design.

1.7 This test method is not intended to simulate site-specific leaching conditions. It has not been demonstrated to simulate actual disposal site leaching conditions.

1.8 This test method is intended to describe the procedure for performing the accelerated weathering of solid materials to generate leachates. It does not describe all types of sampling and analytical requirements that may be associated with its application.

1.9 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.10 *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 75 Practices for Sampling Aggregates[3]

D 276 Test Methods for Identification of Fibers in Textiles[4]

D 420 Guide to Site Characterization for Engineering, Design and Construction Purposes[5]

D 653 Terminology Relating to Soil, Rock, and Contained Fluids[5]

D 737 Test Method for Air Permeability of Textile Fabrics[6]

D 1067 Test Methods for Acidity or Alkalinity of Water[6]

D 1125 Test Methods for Electrical Conductivity and Resistivity of Water[7]

D 1193 Specification for Reagent Water[7]

D 1293 Test Methods for pH of Water[7]

D 1498 Practice for Oxidation-Reduction Potential of Water[7]

D 2234 Test Methods for Collection of a Gross Sample of Coal[8]

D 3370 Practices for Sampling Water[7]

E 276 Test Method for Particle Size or Screen Analysis at No. 4 (4.75-mm) Sieve and Finer for Metal-Bearing Ores and Related Materials[9]

E 877 Practice for Sampling and Sample Preparation of Iron Ores and Related Materials[10]

[1] This test method is under the jurisdiction of ASTM Committee D34 on Waste Management and is the direct responsibility of Subcommittee D34.01.04 on Waste Leaching Techniques.

Current edition approved March 10, 1996. Published May 1996.

[2] The boldface numbers in parentheses refer to the list of references at the end of this standard.

[3] *Annual Book of ASTM Standards*, Vol 04.03.

[4] *Annual Book of ASTM Standards*, Vol 07.01.

[5] *Annual Book of ASTM Standards*, Vol 04.08.

[6] *Discontinued*; see *1994 Annual Book of ASTM Standards*, Vol 07.01.

[7] *Annual Book of ASTM Standards*, Vol 11.01.

[8] *Annual Book of ASTM Standards* , Vol 05.05.

[9] *Annual Book of ASTM Standards*, Vol 03.05.

[10] *Annual Book of ASTM Standards*, Vol 03.06.

Copyright © ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, United States.