



Standard Test Method for Rapid Radiochemical Determination of Americium-241 in Water¹

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1. Scope

1.1 This test method is specifically for Americium-241 (^{241}Am) in drinking water and other aqueous samples. However, if any isotopes of curium are present in the sample, they will be carried with americium during the analytical separation process and will be observed in the final alpha spectrum. The presence of ^{243}Am in the water sample will bias the results obtained by this test method.

1.2 This test method is applicable to samples in which radioactive contamination is from either known or unknown origins. If any filtration of the sample is performed before starting the analysis, those solids should be analyzed separately. The results from the analysis of these solids should be reported separately (as a suspended activity concentration for the water volume filtered) but identified with the filtrate results.

1.3 This test method is applicable to the determination of soluble ^{241}Am . This test method is not applicable to the determination of ^{241}Am in highly insoluble particulate matter possibly present in water samples contaminated as a result of a radiological dispersal device (RDD) event.

1.4 This test method uses rapid radiochemical separation techniques for determining americium in water samples following a radiological or nuclear incident. Although, with this test method, concentrations of ^{241}Am on the same order of magnitude as methods used for the Safe Drinking Water Act (SDWA) can be detected, this test method is not a substitute for SDWA-approved methods for ^{241}Am .

1.5 *Units*—The values stated in SI units are to be regarded as the standard. No other units of measurement are included in this standard.

1.6 *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.*

¹ This test method is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.04 on Methods of Radiochemical Analysis.

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2. Referenced Documents

2.1 ASTM Standards:²

C1163 Practice for Mounting Actinides for Alpha Spectrometry Using Neodymium Fluoride

C1284 Practice for Electrodeposition of the Actinides for Alpha Spectrometry

D1129 Terminology Relating to Water

D1193 Specification for Reagent Water

D3370 Practices for Sampling Water from Closed Conduits

D4448 Guide for Sampling Ground-Water Monitoring Wells

D5847 Practice for Writing Quality Control Specifications for Standard Test Methods for Water Analysis

D6001 Guide for Direct-Push Groundwater Sampling for Environmental Site Characterization

D7282 Practice for Set-up, Calibration, and Quality Control of Instruments Used for Radioactivity Measurements

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology D1129.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *analytical action level, AAL, n*—denotes the value of a quantity that will cause the decision maker to choose an alternative action.

3.2.2 *analytical protocol specifications, APS, n*—output of a directed planning process that contains the project's analytical data needs and requirements in an organized, concise form.

3.2.3 *discrete radioactive particles, DRPs or hot particles, n*—particulate matter in a sample of any matrix in which a high concentration of radioactive material is contained in a tiny particle (micrometre range).

3.2.4 *measurement quality objective, MQO, n*—analytical data requirements of the data quality objectives; project- or program-specific.

3.2.4.1 *Discussion*—They can be quantitative or qualitative. MQOs serve as measurement performance criteria or objectives of the analytical process.

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.