



Designation: D5086 – 20

Standard Test Method for Determination of Calcium, Magnesium, Potassium, and Sodium in Atmospheric Wet Deposition by Flame Atomic Absorption Spectrophotometry¹

This standard is issued under the fixed designation D5086; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This test method is applicable to the determination of calcium, magnesium, potassium, and sodium in atmospheric wet deposition (rain, snow, sleet, and hail) by flame atomic absorption spectrophotometry (FAAS) (1).²

1.2 The concentration ranges are listed below. The range tested was confirmed using the interlaboratory collaborative test (see Table 1 for a statistical summary of the collaborative test).

	MDL (mg/L) (2)	Range of Method (mg/L)	Range Tested (mg/L)
Calcium	0.009	0.03–3.00	0.168–2.939
Magnesium	0.003	0.01–1.00	0.039–0.682
Potassium	0.003	0.01–1.00	0.029–0.499
Sodium	0.003	0.01–2.00	0.105–1.84

1.3 The method detection limit (MDL) as given in 1.2 is based on single operator precision. Detection limits vary by instrumentation. Laboratories may be able to achieve lower detection limits. The method detection limit for this method as described in 1.2 was determined in 1987 (2).

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.* Specific warning statements are given in 8.3, 8.7, 12.1.8, and Section 9.

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:³

D883 Terminology Relating to Plastics
D1129 Terminology Relating to Water
D1193 Specification for Reagent Water
D1356 Terminology Relating to Sampling and Analysis of Atmospheres
D2777 Practice for Determination of Precision and Bias of Applicable Test Methods of Committee D19 on Water
D4453 Practice for Handling of High Purity Water Samples
D4691 Practice for Measuring Elements in Water by Flame Atomic Absorption Spectrophotometry
D5012 Guide for Preparation of Materials Used for the Collection and Preservation of Atmospheric Wet Deposition
E131 Terminology Relating to Molecular Spectroscopy
E275 Practice for Describing and Measuring Performance of Ultraviolet and Visible Spectrophotometers
E694 Specification for Laboratory Glass Volumetric Apparatus
IEEE/ASTM SI-10 Standard for Use of the International System of Units (SI): The Modern Metric System

2.2 ISO Standard:⁴

ISO 8655 Piston-Operated Volumetric Apparatus — Part 2: Piston Pipettes

¹ This test method is under the jurisdiction of ASTM Committee D22 on Air Quality and is the direct responsibility of Subcommittee D22.03 on Ambient Atmospheres and Source Emissions.

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² The boldface numbers in parentheses refer to a list of references at the end of this test method.

³ 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.

⁴ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.