



Designation: D6520 – 18

Standard Practice for the Solid Phase Micro Extraction (SPME) of Water and its Headspace for the Analysis of Volatile and Semi-Volatile Organic Compounds¹

This standard is issued under the fixed designation D6520; 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 procedures for the extraction of volatile and semi-volatile organic compounds from water and its headspace using solid phase micro extraction (SPME).

1.2 The compounds of interest must have a greater affinity for the SPME-adsorbent polymer or adsorbent or combinations of these than the water or headspace phase in which they reside.

1.3 Not all of the analytes that can be determined by SPME are addressed in this practice. The applicability of the adsorbent polymer, adsorbent, or combination thereof, to extract the compound(s) of interest must be demonstrated before use.

1.4 This practice provides sample extracts suitable for quantitative or qualitative analysis by gas chromatography (GC) or gas chromatography-mass spectrometry (GC-MS).

1.5 Where used, it is the responsibility of the user to validate the application of SPME to the analysis of interest.

1.6 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.7 *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 specific hazard statements, see Section 12.

1.8 *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

D1193 Specification for Reagent Water

D3370 Practices for Sampling Water from Closed Conduits

D3694 Practices for Preparation of Sample Containers and for Preservation of Organic Constituents

D3856 Guide for Management Systems in Laboratories Engaged in Analysis of Water

D4448 Guide for Sampling Ground-Water Monitoring Wells

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this standard, refer to Terminology D1129.

4. Summary of Practice

4.1 This practice employs adsorbent/liquid or adsorbent/gas extraction to isolate compounds of interest. An aqueous sample is added to a septum-sealed vial. The aqueous phase or its headspace is then exposed to an adsorbent coated on a fused silica fiber. The fiber is desorbed in the heated injection port of a GC or GC-MS or the injector of an high-performance liquid chromatography (HPLC).

4.2 The desorbed organic analytes may be analyzed using instrumental methods for specific volatile or semi-volatile organic compounds. This practice does not include sample extract clean-up procedures.

5. Significance and Use

5.1 This practice provides a general procedure for the solid phase micro extraction of volatile and semi-volatile organic compounds from an aqueous matrix or its headspace. Solid sorbent extraction is used as the initial step in the extraction of organic constituents for the purpose of quantifying or screening for extractable organic compounds.

¹ This practice is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.06 on Methods for Analysis for Organic Substances in Water.

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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.