



Designation: D5241 – 92 (Reapproved 2024)

Standard Practice for Micro-Extraction of Water for Analysis of Volatile and Semi-Volatile Organic Compounds in Water¹

This standard is issued under the fixed designation D5241; 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 standard procedures for extraction of volatile and semi-volatile organic compounds from water using small volumes of solvents.

1.2 The compounds of interest must have a greater solubility in the organic solvent than the water phase.

1.3 Not all of the solvents that can be used in micro extraction are addressed in this practice. The applicability of a solvent to extract the compound(s) of interest must be demonstrated before use.

1.4 This practice provides sample extracts suitable for any technique amenable to solvent injection such as gas chromatography or high performance liquid chromatography (HPLC).

1.5 The values stated in SI units are to be regarded as 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* For specific hazard statements, see Section 9.

1.7 *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

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.

D1193 Specification for Reagent Water

D3370 Practices for Sampling Water from Flowing Process Streams

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 (Withdrawn 2024)³

D3973 Test Method for Low-Molecular Weight Halogenated Hydrocarbons in Water

D4210 Practice for Intralaboratory Quality Control Procedures and a Discussion on Reporting Low-Level Data (Withdrawn 2002)³

D4448 Guide for Sampling Ground-Water Monitoring Wells

D5175 Test Method for Organohalide Pesticides and Polychlorinated Biphenyls in Water by Microextraction and Gas Chromatography

3. Summary of Practice

3.1 This practice employs liquid/liquid extraction to isolate compounds of interest. The sample is added to an extraction device. The solvent may be added to the sample container or an extraction device and extracted for a period of 5 min. The solvent is then ready for analysis. If required, the pH may be adjusted and salt may be added prior to extraction to increase the extraction specificity and efficiency.

3.2 The solvent extract may be further processed using sample clean-up and concentration techniques. The analytes in the solvent may be analyzed using instrumental methods for specific volatile or semivolatile organic compounds. This practice does not include sample extract clean-up methods.

4. Significance and Use

4.1 This practice provides a general procedure for the solvent extraction of volatile and semi-volatile organic compounds from a water matrix. Solvent extraction is used as the initial step in the solvent extraction of organic constituents for the purpose of quantifying extractable organic compounds.

4.2 Typical detection limits that can be achieved using micro-extraction techniques with gas chromatography (GC)

³ The last approved version of this historical standard is referenced on www.astm.org.