U.S. Department of Commerce
Juanita M. Kreps
Secretary

National Bureau of Standards
Ernest Ambler, Director

National Bureau of Standards

Certificate of Analysis

Standard Reference Material 1641a

Mercury in Water - μg/mL

This Standard Reference Material is intended for use in the primary calibration of instruments and techniques used for the determination of mercury in natural waters. It is designed both for the preparation of calibration solutions and for use as a "spike" sample in a "method-of-additions" type analytical procedure.

Mercury concentration . . . . . 1.10 ± 0.05 μg/mL

The estimated uncertainty shown is based on judgment and represents an evaluation of method imprecision and possible systematic errors between methods.

Stability: The long-term stability of trace mercury solutions has been a constant problem. At or below the μg/mL level, mineral acid stabilization is not sufficient. However, the addition of trace gold to a nitric acid solution of mercury was found to stabilize the concentration of mercury in SRM 1641 (the previous issue of this Mercury in Water SRM). The mercury concentration of the renewal, SRM 1641a, has not changed significantly in six months. Stability studies of SRM 1641a are continuing. It is recommended that SRM 1641a *not* be used after ONE YEAR FROM DATE OF PURCHASE.

Precautions: Traces of mercury vapor are present in most laboratory situations. Therefore, contamination of reagents, equipment, and common laboratory materials may cause a severe problem. Apparatus for analysis at this level must be scrupulously cleaned immediately before use, and only the purest-grade reagents, with respect to mercury, should be employed.

Washington, D.C. 20234
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J. Paul Cali, Chief
Office of Standard Reference Materials

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SRM 1641a was prepared by J. R. Moody. Atomic absorption analyses were performed by T. C. Rains and J. D. Messman; and neutron activation analyses by H. L. Rook and C. A. Grabnegger.

The overall direction and coordination of technical measurements leading to certification were performed under the chairmanship of H. L. Rook and I. L. Barnes of the NBS Center for Analytical Chemistry.

The technical and support aspects involved in the preparation, certification, and issuance of this Standard Reference material were coordinated through the Office of Standard Reference Materials by R. Alvarez.

Analytical: Two independent techniques were used in the certification of this Standard Reference Material: atomic absorption spectrometry and neutron activation analysis. Concordant results were obtained by these two independent analytical methods.

Use: This SRM consists of 6 ampoules, each containing approximately 20 mL of solution. Dilutions may be made by the addition of accurately measured aliquots, withdrawn from an ampoule, to known volumes of pure or natural water (spiking mode) using conventional techniques. Blank determinations should be made of the water and other reagents used.

The reliability of the dilution process will depend on the care exercised and the reliability of the calibration of the volumetric apparatus, which should be within one percent to be consistent with the accuracy of this SRM. The volumetric ware should be scrupulously cleaned; and the solutions prepared should be used without delay, as their stability cannot be certified. SRM 1642a, which is certified for mercury at the ng mL level, should be used to validate methodology for these concentrations.

The long-term retention of unused portions of this Standard Reference Material in opened ampoules is not recommended.