

National Bureau of Standards Certificate

Standard Reference Material 1642a

Mercury in Water- ng/mL

This Standard Reference Material is intended for use in the primary standardization of instruments and techniques used for the determination of mercury in water. It is intended for use as received, without dilution or other alteration. The concentration of mercury in this Standard Reference Material is at, or near, the detection limit of most commercial instruments used for the determination of mercury in water. It is to be used for the primary standardization of these instruments near these detection limits where many analytical problems occur.

Mercury Concentration 1.10 ± 0.06 ng/mL

The uncertainty value shown, ± 0.06 , expresses an estimate of the overall uncertainty of the certified value. The uncertainty value, ± 0.06 , includes twice the standard error of the average by two analytical techniques (a total of 36 determinations) plus an estimated upper bound for possible systematic errors.

Stability: Trace mercury solutions have been a constant problem when long-term storage is required. Below the $\mu\text{g/mL}$ level, mineral acid stabilization is not sufficient. A new stabilizing technique has been applied to this Standard Reference Material that allows for prolonged storage. Gold, as the tetrachloride, has been added in a concentration 25 times that of the mercury. The gold ion, in conjunction with the normal mineral acid, has proven to be an effective stabilizer. It is recommended that this Standard Reference Material not be used after ONE YEAR FROM DATE OF PURCHASE.

This Standard Reference Material was prepared by J. R. Moody. Atomic absorption analyses were performed by T. C. Rains and J. D. Messman, and neutron-activation analyses were performed by H. L. Rook.

The overall direction and coordination of the technical measurements leading to the certification were performed under the chairmanship of H. L. Rook. The statistical evaluation was done by J. Mandel.

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.

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

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Precautions: Traces of mercury vapor are present in most laboratory situations. Therefore, contamination of reagents, equipment, and common laboratory materials is a severe problem. Apparatus for analyses at this level must be scrupulously cleaned immediately before use, and only the purest-grade reagents should be employed. After use, the bottle should be capped tightly and placed inside the aluminized bag, which should be folded and sealed with a sealing tape. This safeguard will assist in maintaining the integrity of the sample.

Analytical: Two independent techniques were used in the certification of this Standard Reference Material: atomic absorption spectroscopy and neutron activation analysis.

Use: This Standard Reference Material should be used as received, without dilution. It may be carried through the chemical manipulations required for the analytical procedure normally used for the analysis of natural waters.