National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material® 997

Isotopic Standard for Thallium

This Standard Reference Material (SRM) is certified for use as an isotopic standard. SRM 997 consists of approximately 0.25 g of a commercial, high-purity thallium metal. **NOTE:** While this SRM is a high-purity material for isotopic purposes, it oxidizes rapidly and cannot be used for assay purposes. The certified isotopic compositions are given below together with the atomic weight of thallium.

Absolute Abundance Ratio	$^{205}Tl/^{203}Tl$	2.38714	±	0.001 01
Thallium Atomic Weight		204.38333	±	0.000 18
Isotopic Composition:				
^{203}Tl Atom Percent		29.5235	±	0.008 8
^{205}Tl Atom Percent		70.4765	±	0.008 8

The above indicated uncertainties are the overall limits of error based on the sum of 95 % confidence limits for the mean and allowances for the effects of known sources of possible systematic error.

This SRM was used in the determination of the absolute abundance ratio and atomic weight of thallium [1]. The absolute abundance ratio of $^{205}Tl/^{203}Tl$ was determined by single filament thermal ionization mass spectrometry. Mixtures of known $^{205}Tl/^{203}Tl$, prepared from nearly pure separated thallium isotopes, were used to calibrate the mass spectrometers.

The overall direction and coordination of the technical measurements leading to certification of this SRM were performed under the chairmanship of I.L. Barnes of the NBS[1] Inorganic Analytical Chemistry Division, and W.C. Purdy, McGill University, Montreal, Quebec, Canada.

The analytical measurements leading to the certification of this material were performed in the NBS Inorganic Analytical Research Division. Mass spectrometric measurements were made by L.J. Powell and J.W. Gramlich on calibration mixes prepared by L.J. Powell. The purity of the separated isotopes was determined by P.J. Paulsen using spark source mass spectrometry.

Statistical analysis of the data was performed by H.H. Ku of the NBS Statistical Engineering Division.

Issuance of this Standard Reference Material was coordinated through the Office of Standard Reference Materials by R.W. Seward. Revision of this certificate was coordinated through the NIST Standard Reference Materials Program by B.S. MacDonald of the NIST Measurement Services Division.

Willie E. May, Chief
Analytical Chemistry Division

Gaithersburg, MD 20899
Certificate Issue Date: 01 December 2004
See Certificate Revision History on Last Page

Robert L. Watters, Jr., Chief
Measurement Services Division

[1] In 1988 the name of the National Bureau of Standards (NBS) was changed to the National Institute of Standards and Technology (NIST).

REFERENCE

[1] Dunstan, L.P.; Gramlich, J.W.; Barnes, I.L.; Purdy, W.C.; J. Res. Nat. Bur. Stand. (U.S.); Vol. 85, No. 1, pp. 1-10 (1980).

Certificate Revision History: 01 December 2004 (This revision corrects the description of unit size to be approximately 0.25 g and makes editorial changes to reflect organizational changes at NIST and the Department of Commerce. No attempt was made to reevaluate the certificate values or other technical data presented in the certificate); 23 July 1986 (Original certificate date).

Users of this SRM should ensure that the certificate in their possession is current. This can be accomplished by contacting the SRM Program at: telephone (301) 975-6776; fax (301) 926-4751; e-mail srminfo@nist.gov; or via the Internet at http://www.nist.gov/srm.