National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material 981

Common Lead Isotopic Standard

This Standard Reference Material (SRM) is intended primarily for use as an isotopic standard. SRM 981 consists of 1 gram of a commercially available, high purity lead metal, of 99.9 + percent purity, that was extruded into wire form. The atomic weight of the material is calculated to be 207.215 using the nuclidic masses 203.973044, 205.974468, 206.975903, and 207.976650. The certified isotopic compositions are given below.

Atomic Abundance Ratio, Lead-204/Lead-206 ... 0.059042 ± 0.000037

Atomic Abundance Ratio, Lead-207/Lead-206 ... 0.91464 ± 0.00033

Atomic Abundance Ratio, Lead-208/Lead-206 ... 2.1681 ± 0.0008

Lead-204, atom percent ..... 1.4255 ± 0.0012

Lead-206, atom percent ..... 24.1442 ± 0.0057

Lead-207, atom percent ..... 22.0833 ± 0.0027

Lead-208, atom percent ..... 52.3470 ± 0.0086

Overall limits of error are based on 95 percent confidence limits for the mean of the ratio measurements and on allowances for the known sources of possible systematic error.

Measurements for certification were by triple filament solid-sample mass spectrometry. Mixtures with known $^{208}Pb/^{206}Pb$ ratio, prepared from high-purity separated isotope solutions, were used as comparison standards. Details of the preparation and measurements were published by E.J. Catanzaro, T.J. Murphy, W.R. Shields, and E.L. Garner, J. Research NBS 72A, No. 3,261 (1968).

The analytical measurements leading to the certification of this material were performed in the NIST Inorganic Analytical Research Division.

The overall coordination of efforts leading to the update and revision of this certificate was coordinated through the Standard Reference Materials Program by T. E. Gills.

Gaithersburg, MD 20899
March 25, 1991
(Revision of certificate dated 4-10-73)

William P. Reed, Chief
Standard Reference Materials Program