



National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material 1579a

Powdered Lead Based Paint

This Standard Reference Material (SRM) is intended for use in the calibration of apparatus and the evaluation of methods used in the determination of lead in paint. SRM 1579a is intended to mimic or resemble the paint on interior surfaces of old housing (see section on Collection). It consists of 35 grams of a fine homogeneous powder of which 99+ percent passes a 45 μm (No. 325) sieve. The certified value is given below and is based on analysis of at least a 100 milligram sample of the as-received material.

Lead Content: 11.995 ± 0.031 Weight Percent

The certified value is based on measurements by isotope dilution mass spectrometry (IDMS). The uncertainty given is the 95% confidence interval of the certified value.

The overall direction and coordination of the technical measurements leading to this certificate were performed by R.D. Vocke of the Inorganic Analytical Research Division.

Statistical calculations were carried out by S.B. Schiller of the Statistical Engineering Division.

The technical and support aspects involved in the preparation, certification, and issuance of this Standard Reference Material were coordinated through the Standard Reference Materials Program by J.S. Kane.

Preparation, Testing, and Analysis

Collection

The paint for this Standard Reference Material was collected by the staff of the Philadelphia Department of Public Health from the interior surfaces of dwellings undergoing renovation. The paint was softened with a hand torch, scraped from the plaster and wood substrates, and collected in plastic bags as a heterogeneous mixture of many different kinds of paints. In the laboratory, non-paint matter such as bits of metal, plastic, glass, and wood were removed and the paint mixture was ground in a disk mill to produce a material suitable for feeding into a jet mill. The paint was comminuted in a jet mill operating at 6.895×10^5 Pa (100 psig) air pressure, then sieved through a 149 μm (No. 100) vibrating screen to remove the coarse, non-grindable fraction. Two additional passes through the jet mill at $6.68\text{-}7.37 \times 10^5$ Pa (97-107 psig) gave fine powder with 99.31 weight percent passing through a 45 μm (No. 325) sieve.

Homogeneity

Sample homogeneity was ascertained by X-ray fluorescence analysis for lead content on 17 samples chosen at random from the total lot. A statistical analysis of the data from 136 observations showed the bottle-to-bottle variability among the samples to be no greater than 0.02 percent lead. No within-bottle variation with respect to lead was detected.

Gaithersburg, MD 20899
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William P. Reed, Chief
Standard Reference Materials Program

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Analysis

The IDMS analyses were performed by E.S. Beary, K.E. Murphy, P.J. Paulsen and R.D. Vocke of the Inorganic Analytical Research Division.

Certification of this Standard Reference Material in 1973 employed polarographic and atomic absorption spectrometric analyses, which have been described in detail in NIST Special Publication 260-45. [1]. Reanalysis using isotope dilution thermal ionization mass spectrometry has indicated a very small but statistically significant low bias in the original certified value due to incomplete dissolution. The material has therefore been recertified as SRM 1579a.

References

1. Development of NBS Standard Reference Material: No. 1579 Powdered Lead-Based Paint, B. Greifer, E.J. Maienthal, T.C. Rains and S.D. Rasberry 1973 NBS Special Publication 260-45.