# National Institute of Standards & Technology

# Certificate of Analysis

## Standard Reference Material® 987

### Strontium Carbonate Standard

Strontium Carbonate ($SrCO_3$) alkalimetric assay, mass fraction: 99.98 % ± 0.02 %

| | |
|---|---|
| Absolute Abundance Ratios | $^{88}Sr/^{86}Sr = 8.37861 \pm 0.00325$ |
| | $^{87}Sr/^{86}Sr = 0.71034 \pm 0.00026$ |
| | $^{84}Sr/^{86}Sr = 0.05655 \pm 0.00014$ |
| that yields atom percents of: | $^{88}Sr = 82.5845 \pm 0.0066$ |
| | $^{87}Sr = 7.0015 \pm 0.0026$ |
| | $^{86}Sr = 9.8566 \pm 0.0034$ |
| | $^{84}Sr = 0.5574 \pm 0.0015$ |

This Standard Reference Material (SRM) is certified for use as an assay and isotopic standard. The material consists of highly purified strontium carbonate and is of high homogeneity. The assay value should make it useful by direct weighing for calibrating "spike" material for strontium assays by isotope dilution mass spectrometry, as well as a useful material for the calibration of mass spectrometers.

The assay was determined by using a coulometric procedure in which an excess of accurately standardized hydrochloric acid is reacted with a known mass of the dried sample and the excess hydrochloric acid is determined coulometrically. The results from 11 independent determinations showed a total alkalinity equivalent to 99.98 % strontium carbonate.

This material was used as the reference sample in a determination of abundance ratios and atomic weight of strontium [1]. The indicated uncertainties are overall limits of error based on the 95 % confidence limits for the means and allowances for the effects of possible systematic error. The atomic weight of strontium calculated from the absolute abundance ratios is 87.61681 ± 0.00012.

The technical and support aspects involved in the original preparation, certification, and issuance of this SRM were coordinated through the Office of Standard Reference Materials by T.W. Mears. Revision of this certificate was coordinated through the NIST Standard Reference Materials Program by N.M. Trahey.

*This Certificate of Analysis has undergone editorial revision to reflect program and editorial changes at NIST and the Department of Commerce. No attempt was made to reevaluate the certificate values or any technical data presented in this certificate.*

Willie E. May, Chief
Analytical Chemistry Division

Gaithersburg, MD 20899
Certificate Issue Date: 1 May 2000
*See Certificate Revision History on Last Page*

Nancy M. Trahey, Chief
Standard Reference Materials Program

The overall direction and coordination of the technical measurements leading to the certification and current update of this SRM were performed under the chairmanship of I.L. Barnes and W.R. Shields of the NIST Analytical Chemistry Division.

The characterization of this SRM was performed by G. Marinenko, E.E. Etz, D.G. Friend, I.L. Barnes, L.J. Moore, T.C. Rains, T.A. Rush, L.A. Machlan, T.J. Murphy, and P.J. Paulsen, all of the NIST Analytical Chemistry Division.

The strontium carbonate used for this SRM was obtained from Spex Industries, Inc. of Metuchen, NJ. The material, when received, was of high purity in relation to cationic impurities but assayed only 99.0 % due to moisture and other volatile impurities. Ignition at 800 °C for 16 h under an atmosphere of carbon dioxide removed the moisture and other volatile impurities and converted the compound to essentially stoichiometric strontium carbonate. (Other commercial high purity lots of strontium carbonate exhibited the same order of low assay.) The material is only slightly hygroscopic, absorbing 0.02 % moisture at 90 % relative humidity but can be dried to the anhydrous state by heating for 1 h at 110 °C. The material should therefore be dried at 110 °C for 1 h before use.

The impurities reported in the strontium carbonate material are lithium, 4 mg/kg; sodium, 6 mg/kg; potassium, < 1 mg/kg; magnesium, < 2 mg/kg; calcium, 5 mg/kg; barium, < 15 mg/kg; copper, < 3 mg/kg; iron, < 3 mg/kg; aluminum, < 1 mg/kg; and silicon, < 1 mg/kg.

## REFERENCE

[1] Moore, L.J., Murphy, T.J., Barnes, I.L., and Paulsen, P.J., Absolute Isotopic Abundance Ratios and Atomic Weight of a Reference Sample of Strontium, J. of Res. (NBS), **87**, No. 1, pp. 1-8 (1982).

**Certificate Revision History:** 1 May 2000 (editorial revisions); 1 October 1982 (revision of certified values); 6 March 1972 (editorial revisions); 8 November 1971 (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 http://www.nist.gov/srm.*