

National Bureau of Standards

Certificate

Standard Reference Material 4264

Point-Source Gamma-Ray-Emission-Rate Standard

Tin-121m

This Standard Reference Material consists of tin-121m, deposited as the chloride, onto polyester tape approximately 0.006-cm thick, and covered by another layer of the same tape. The tape is supported on a thin aluminum annulus 3.8-cm inside diameter and 5.4-cm outside diameter.

The number of antimony-121 37.15-keV gamma rays emitted per second at 1200 EST, May 1, 1977, was

$$* \qquad \qquad \pm 3.0\%*.$$

This gamma-ray-emission rate was obtained from a gamma-ray intercomparison with a standard, the gamma-ray-emission rate of which was measured with the National Bureau of Standards pure germanium-detector system, using a full-energy-peak-efficiency versus energy curve derived from measurements of other National Bureau of Standards' photon-emission-rate standards.

The uncertainty in the above-quoted 37.15-keV gamma-ray-emission rate, 3.0 percent, is the linear sum of 0.6 percent, which is the limit of the random error at the 99-percent confidence level ($4.604 S_m$, where S_m is the standard error computed from five measurements) of the gamma-ray-emission-rate comparison, and 2.4 percent, which is the sum of the estimated upper limits of conceivable systematic errors.

The solution from which this Standard Reference Material was prepared was examined for photon-emitting impurities with a Ge(Li)-spectrometer system, and ^{113}Sn - $^{113\text{m}}\text{In}$ was identified as an impurity. As of the calibration date, the activity ratio of ^{113}Sn - $^{113\text{m}}\text{In}/^{121\text{m}}\text{Sn}$ was approximately 4×10^{-5} . No other photon-emitting impurities were found.

This Standard Reference Material was prepared and calibrated in the Center for Radiation Research, Radioactivity Section, W. B. Mann, Chief.

J. Paul Cali, Chief
Office of Standard Reference Materials

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