

# National Bureau of Standards Certificate

## Standard Reference Material 4264-B

### Point-Source Gamma-Ray-Emission-Rate Standard

Radionuclide	Tin-121m (1)*
Source identification	4264-B-
Emission rate of the 37.15-keV gamma ray	s <sup>-1</sup>
Reference time	1200 EST August 7, 1982
Half life	34.9 ± 1.2 years (2)
Measuring instrument	Germanium spectrometry system (3)
Random uncertainty	0.8 percent (4)
Systematic uncertainty	2.0 percent (5)
Total uncertainty (Random plus Systematic)	2.8 percent
Photon-emitting-impurity	None detected (6)

This Standard Reference Material was prepared in the Center for Radiation Research, Nuclear Radiation Division, Radioactivity Group, Dale D. Hoppes, Group Leader.

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NOTES

- (1) The point source support is a 5.4-cm-diameter x 1-mm-thick aluminum annulus supporting a 0.006-cm-thick layer of polyester tape. The active source is a dried deposit of tin-121m as the chloride, covered with another layer of the same tape.
- (2) NBS value based on two measurements on the same source over an interval of 5.3 years.
- (3) A calibrated germanium-spectrometry system was used to calibrate a reference source. Intercomparison of this SRM with the reference source was performed with a NaI(Tl) detector.
- (4) Half the 99-percent confidence interval of the mean (3.707 times the standard error computed from 7 NaI(Tl) detector measurements). 0.8 percent
- (5) Linear sum of estimated uncertainty limits due to:
  - a) Half the 99-percent confidence interval of the mean (3.707 times the standard error computed from 7 germanium-spectrometer measurements). 1.3 percent
  - b) Spectrometer efficiency calibration 0.4 percent
  - c) Source positioning for spectrometry system 0.1 percent
  - d) NaI(Tl) intercomparison geometry 0.2 percent
- (6) The estimated detection limit, as a percentage of the gamma-ray-emission rate of the 37.15 keV gamma ray from the decay of tin-121m, is:

0.01 percent for energies between 42 keV and 1900 keV.