U. S. Department of Commerce
Alexander B. Trowbridge,
Secretary

National Bureau of Standards
A. V. Astin, Director

Certificate

Standard Reference Material 4202
Gamma-Ray Standard
Cadmium—109—Silver—109m

This standard consists of cadmium-109 deposited, as the chloride, on polyester tape approximately 0.006-centimeter thick and covered by another layer of the same tape.

The number of silver-109m gamma rays emitted per second at 1200 EST December 21, 1967, was

* $\pm 1.8_0\%$*.

This standard is a dried deposit of an accurately weighed aliquot of master solution whose gamma-ray-emission rate was determined by means of $4\pi\gamma$-NaI(Tl) scintillation counting.

The uncertainty, 1.8_0 percent, is the sum of 0.5_5 percent, which is the statistical error at the 99-percent confidence level (3.25 s_m, where s_m is the computed standard error), and 1.2_5 percent, which is the maximum uncertainty due to assessable systematic errors in the preparation and measurement of this standard.

The gamma-ray spectrum of the material from which this standard was prepared was examined using a lithium-drifted germanium detector and no radioactive impurities were observed.

A half life of 449.8 days $\pm 0.4_6$ percent is suggested. This value is based on 16 sets of $4\pi\gamma$ ionization-chamber measurements using a sample of the master solution. The uncertainty, 0.4_6 percent, is one standard error, s_m. Half-life and radioactive-purity measurements are being made periodically on this material, and users will be notified if the measurements indicate any significant departure from the suggested half life.

This standard was prepared and calibrated in the Center for Radiation Research by members of the Radioactivity Section, W. B. Mann, Chief.

Washington, D.C. 20234
March 1, 1968

W. Wayne Meinke, Chief
Office of Standard Reference Materials

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