

Certificate

STANDARD REFERENCE MATERIAL 4209

Gamma-Ray Standard

Yttrium-88

This standard consists of yttrium-88 deposited, as the chloride, on polyester tape approximately 0.006-centimeter thick and covered by another layer of the same tape.

The number of 1.84-MeV gamma rays of strontium-88 emitted per second at 1200 EST May 23, 1969, was

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This standard is a dried deposit of an accurately weighed aliquot of a solution whose gamma-ray-emission rate was measured in the National Bureau of Standards $4\pi\gamma$ ionization chamber which had previously been calibrated by means of sources calibrated by x- γ coincidence counting.

The fraction of yttrium-88 nuclei decaying by 1.84-MeV gamma-ray emission was assumed to be 0.994. Internal conversion of the 1.84-MeV transition was assumed to be negligible.

The uncertainty in the gamma-ray-emission rate, 1.9₇ percent, is the sum of 0.1₈ percent, which is the limit of the random error at the 99-percent confidence level (i.e. $3.25 s_m$, where s_m is the standard error computed from ten groups of measurements), and 1.7₉ percent, which is the maximum uncertainty due to the estimated systematic errors in the calibration of the $4\pi\gamma$ ionization chamber and in these measurements.

The material from which this standard was prepared was examined for impurities with both NaI(Tl)- and Ge(Li)-gamma-ray spectrometers and no impurities were observed.

A half life of 106.58 ± 0.02 days is suggested. This value is the weighted mean of two determinations on two preceding series of standards and is based on forty-three sets of $4\pi\gamma$ ionization-chamber measurements. The error, 0.02 day, is the weighted standard error. Half-life measurements and gamma-ray-spectrum analyses will be made periodically, and users of this material will be notified if the measurements indicate departure from the previously found results.

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

Washington, D. C. 20234
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J. Paul Cali, Acting Chief
Office of Standard Reference Materials

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