

National Bureau of Standards Certificate Standard Reference Material 4403H Radioactivity Standard Strontium-85

This Standard Reference Material consists of strontium-85 and carrier in _____ grams of solution in a flame-sealed glass ampoule. The carrier solution contains 2.03 milligrams of strontium per gram of approximately 1 M HCl and its density is 1.014 ± 0.002 g/ml at 22.2°C.

The activity of the strontium-85 in nuclear transformations per second per gram of solution as of 1200 EST September 30, 1975, was

$$*1.909 \times 10^8 \pm 1.42\%*$$

This Standard Reference Material was measured in the National Bureau of Standards " 4π " γ ionization chamber, which had previously been calibrated with strontium-85 solutions from which quantitative sources had been prepared and calibrated by x - γ coincidence counting.

The uncertainty in the value of the activity, 1.42 percent, is the linear sum of 0.045 percent, which is the limit of the random error at the 99-percent confidence level ($2.845 S_m$, where S_m is the standard error computed from 21 measurements) and 1.37 percent, which is the estimated upper limit 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 and cesium-134, rubidium-84 and rubidium-86 were observed to be present. On October 1, 1975 at 2300 EST, the ratios of the activity of each impurity to the activity of strontium-85 were

cesium-134	$1.04 \times 10^{-4} \pm 25\%$
rubidium-84	$6.40 \times 10^{-4} \pm 25\%$
rubidium-86	$1.04 \times 10^{-3} \pm 25\%$

Any other radionuclide emitting a photon with energy less than 514 keV and having an emission rate greater than 10^{-3} that of the 514-keV gamma ray of strontium-85 would have been detected; the corresponding limit for any gamma ray with energy greater than 514 keV is 10^{-4} . The activity detection limit for selenium-75, a suspected but unobserved impurity, is 10^{-4} that of strontium-85.

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

Washington, D.C. 20234
October, 1975

J. Paul Cali, Chief
Office of Standard Reference Materials

SRM 4403H-