

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

National Bureau of Standards  
A. V. Astin, Director

## Certificate

# Standard Reference Material 4221 Radioactivity Standard Mercury-197

This standard consists of mercury-197 and carrier in  $\pm$  \* grams of solution in a flame-sealed glass ampoule. The carrier solution contains  $\text{Hg}(\text{NO}_3)_2 \cdot \text{H}_2\text{O}$  per liter 0.1 N  $\text{HNO}_3$  gram

\*The uncertainty,  $\pm$  gram, is the statistical tolerance limit computed from a sample size of  $n$ , with 95 percent probability for coverage of 95 percent of the population. See Handbook 91 (Experimental Statistics), U.S. Dept. of Commerce, National Bureau of Standards, pp. 1-14, 1-15, T-11.

The activity of the mercury-197 in nuclear transformations per second per gram of solution, at

\*  $\pm$  %

The solution from which this standard was prepared was standardized by  $X_K-\gamma$  coincidence counting.

The value reported above is based on  $n$  determinations, and the uncertainty, percent is the sum of  $\pm$  percent, which is three times the computed standard error, and percent, which is the linear sum of the systematic errors considered to be possible.

In determining the total activity, 0.933 was used as the number of 67-80-keV photons per nuclear transformation. This value is the sum of: 0.733 K-x-rays from electron capture, 0.008 K-x-rays from internal conversion of the 191-keV transition, and 0.192 77-keV gamma rays.

At the above-stated time, mercury-203, as an impurity was present to less than percent, and mercury-197m to less than percent, as determined by gamma-ray spectrometry.

This standard was prepared and calibrated in the Institute for Basic Standards, Radiation Physics Division, by members of the Radioactivity Section, W. B. Mann, Chief.

WASHINGTON, D. C. 20234  
April, 1967

W. Wayne Meinke, Chief  
Office of Standard Reference Materials