

# Certificate

## STANDARD REFERENCE MATERIAL 4210

### Gamma-Ray Standard

### Cobalt-60

This standard consists of cobalt-60 deposited, as the chloride, on polyester tape approximately 0.006-cm thick and covered by another layer of the same tape.

The activity of the cobalt-60 in nuclear transformations per second at 1200 EST April 15, 1969, was

\* \*

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  $\gamma$ - $\gamma$  and  $4\pi\beta$ - $\gamma$  coincidence counting.

The uncertainty in the activity, 1.1<sub>3</sub> percent, is the sum of 0.2<sub>4</sub> 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 0.8<sub>9</sub> percent, which is the maximum uncertainty due to the estimated systematic errors in the 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  $5.260 \pm 0.003$  years is suggested. This value is the weighted mean of 2 determinations on 2 preceding series of standards and is based on 61 sets of  $4\pi\gamma$  ionization-chamber measurements. The uncertainty, 0.003 year, 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  
May 1969

W. Wayne Meinke, Chief  
Office of Standard Reference Materials

4210-