

# Certificate

## Standard Reference Material 4212

### Gamma-Ray Standard

### Krypton-85

This sample consists of an aluminum disk approximately 1 cm in diameter and 0.008-cm thick, impregnated with krypton-85 by ion bombardment. The aluminum disk is sealed between two glass disks each approximately 0.2-cm thick and 3 cm in diameter, with an epoxy adhesive.

The number of 0.514-MeV gamma rays emitted per second at 1200 EST May 5, 1971, was

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This standard was calibrated by comparing its gamma-ray-emission rate with an NBS working standard of krypton-85, which was calibrated by gamma-ray comparison with an NBS strontium-85 working standard. The gamma-ray intensity of the 0.514-MeV transition in the decay of strontium-85 was assumed to be 0.9853, in conformity with internal conversion coefficient measurements (Nuclear Data Tables A8, 1-198, 1970), and a recent NBS measurement which showed that the intensity of the electron-capture-to-ground state, was less than 1.5 percent of the strontium-85 decays.

The uncertainty in the gamma-ray-emission rate, 2.6<sub>4</sub> percent, is the sum of 0.3<sub>5</sub> percent, which is the limit of the random error at the 99-percent confidence level for the krypton-85 comparisons, and 2.2<sub>9</sub> percent, which is the linear sum of the estimated upper limits of conceivable systematic errors, one of which arises from the assumption that the number of electron-capture transitions to the ground state in the decay of strontium-85 is  $(0.75 \pm 0.75)$  percent.

The gamma-ray spectrum of this material was examined with both Ge(Li)- and NaI(Tl)-spectrometers, and no impurities were observed.

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

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J. Paul Cali, Chief  
Office of Standard Reference Materials

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