

# National Bureau of Standards Certificate Standard Reference Material 4308 Krypton-85 Gamma-Ray Emission-Rate Gaseous Standard

This Standard Reference Material consists of krypton-85 and inactive krypton, flame-sealed in an almost spherical borosilicate-glass ampoule having a volume of approximately 34.5 cm<sup>3</sup>, an outside diameter of 4.2 cm, and wall thickness of approximately 0.12 cm. The pressure of the gas in the ampoule is approximately 200 Torr.

The total number of 0.51399-MeV gamma rays emitted per second at 1200 EST March 15, 1975 was

$$* \quad \pm 3.74*$$

Forty ampoules were mounted on a manifold, filled with krypton-85 and inactive krypton, and flame-sealed. One of the ampoules, which was compared with a calibrated strontium-85 point source using a Ge(Li) spectrometer system, was used to effect the calibration of a NaI(Tl) well detector in which all the ampoules were intercompared.

The uncertainty in the gamma-ray emission rate, 3.74 percent, is the linear sum of 0.54 percent, which is the limit of the random error at the 99-percent confidence level ( $9.925 S_m$ , where  $S_m$  is the standard error computed from 3 measurements), and the estimated upper limit of conceivable systematic error, 3.2 percent, which includes the uncertainty in the activity of the strontium-85 source used to calibrate the Ge(Li) detector, 1.7 percent.

A half-life of  $10.73 \pm 0.06$  years is suggested; this is the half-life adopted by M. J. Martin and P. H. Blichert-Toft [Nuclear Data Tables, A, 8, p. 150, 1970].

The gamma-ray spectrum of this material was examined with a Ge(Li) detector and no impurities were indicated.

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

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