

National Bureau of Standards Certificate

Standard Reference Material 4265B Radioactivity Standard

Radionuclide	Iodine-125
Source identification	#356-
Source description	Point source (1)*
Activity	$\times 10^6$ Bq
Reference time	1200 EST December 9, 1981
Random uncertainty	0.19 percent (2)
Systematic uncertainty	1.30 percent (3)
Total uncertainty (Random plus systematic)	1.49 percent
Photon-emitting impurities	None observed (4)
Half life	60.14 ± 0.11 days (5)
Calibration method	Sum-peak coincidence counting [Cf. J.S. Eldridge and P. Crowther, <i>Nucleonics</i> <u>22</u> , No. 6, 56 (1964)]

This Standard Reference Material was prepared in the Center for Radiation Research, Nuclear Radiation Division, Radioactivity Group, Dale D. Hoppes, Group Leader.

Washington, D.C. 20234
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FOOTNOTES

- (1) The point-source support is a 1-mm thick aluminum annulus which has an inside diameter of 3.8 cm and an outside diameter of 5.4 cm. The source is deposited on ion exchange paper impregnated with Amberlite IRA-400 resin, Cl⁻ form, strong base type. The paper is supported on polyester tape 0.006-cm thick, and covered by another layer of the same tape.
- (2) Half the 99-percent confidence interval of the intercept of the linear extrapolation to zero count rate (2.787 times the standard error of the intercept computed from 26 sum-peak measurements).
- (3) Linear sum of estimated uncertainty limits due to:
 - a) escape loss 0.20 percent
 - b) dead time 0.20 percent
 - c) decay scheme parameters 0.10 percent
 - d) gravimetric measurements 0.20 percent
 - e) timer 0.10 percent
 - f) dilutions 0.20 percent
 - g) integration of areas under peaks 0.20 percent
 - h) source-to-detector distance 0.10 percent
- (4) Limits of detection for impurity gamma rays, as a percentage of the emission rate of the K x-rays emitted in the decay of iodine-125, are 0.01 percent for photons between 40 and 1900 keV.
- (5) NCRP Report No. 58, 1978, p. 376. NBS-measured half-life value is 59.5 ± 0.1 days.