



National Institute of Standards & Technology

Certificate

Standard Reference Material 4320 Radioactivity Standard

Radionuclide	Curium-244
Source identification	SRM 4320
Source description	Liquid in 5-mL flame-sealed glass ampoule
Solution composition	Curium-244 in 1-molar nitric acid
Nominal mass	5.2 grams
Radioactivity concentration	57.4 Bq g ⁻¹
Reference time	1200 EST April 1, 1989
Overall uncertainty	0.87 percent ^{(1)*}
Alpha-particle-emitting impurities (Activities at reference time)	²⁴³ Cm: 0.004 Bq/g ± 50% ⁽²⁾
Half life	18.10 ± 0.02 years ⁽³⁾
Measuring instrument	4π liquid-scintillation counter

This standard reference material was prepared in the Center for Radiation Research, Ionizing Radiation Division, Radioactivity Group, Dale D. Hoppes, Group Leader.

Gaithersburg, MD 20899
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Stanley D. Rasberry, Chief
Office of Standard Reference Materials

*Notes on back

NOTES

(1) Individual uncertainties have the significance of one standard deviation of the mean, or an approximation thereof. The combined uncertainty is the individual uncertainties shown below added in quadrature. The overall uncertainty is taken to be three times the combined uncertainty:

a) alpha-particle-emission-rate measurements	0.18 percent
b) gravimetric measurements	0.05 percent
c) deadtime	0.05 percent
d) background	0.01 percent
e) detection efficiency	0.10 percent
f) count-rate-vs-energy extrapolation to zero energy	0.18 percent
g) half life	0.06 percent
h) photon-emitting impurities	<u>0.00 percent</u>
Combined uncertainty	0.29 percent
	<u>* 3</u>
Overall uncertainty	0.87 percent

(2) Curium-243 is the only radionuclidic impurity that was detected.

The limit of detection for photon-emitting impurities is $0.00004 \gamma \text{ s}^{-1} \text{ g}^{-1}$ for energies between 90 and 1900 keV.

(3) Nuclear Data Sheets 49 (1986) 785.

For further information, call Larry Lucas at (301) 975-5546 or FTS 879-5546.