

National Bureau of Standards

Certificate

Standard Reference Material 4361

Radioactivity Standard

Radionuclide	Hydrogen-3
Source identification	4361-
Source description	Tritiated water in flame-sealed glass bottle (1)*
Mass	grams (2)
Radioactivity concentration	1.312 s ⁻¹ g ⁻¹ (Bq g ⁻¹)
Reference time	1200 EST September 3, 1978
Random uncertainty	0.18 percent (3)
Systematic uncertainty	0.67 percent (4)
Total uncertainty (Random plus systematic)	0.85 percent
Half life	12.43 ± 0.05 years (5,6)
Calibration method	4πβ internal gas proportional counting (6)

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

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George A. Uriano, Chief
Office of Standard Reference Materials

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FOOTNOTES

- (1) Source consists of tritiated water flame-sealed in a "500-ml" borosilicate-glass bottle. The neck of the bottle is equipped with a 19/38-mm standard-taper glass joint to allow the user to reseal the bottle after opening.
- (2) Fifteen of the 100 bottles were weighed and the uncertainty in the masses for these bottles is ± 0.1 grams. The masses of the 85 remaining bottles were determined by comparing their volumes with those of the weighed bottles. The uncertainty in the masses of the unweighed bottles is ± 6 grams.
- (3) Half the 99-percent confidence interval of the mean (4.032 times the standard error computed from six gas counting measurements).
- (4) Linear sum of estimated uncertainty limits due to
 - (a) dilutions 0.42 percent
 - (b) gram mole measurements in the gas counting 0.15 percent
 - (c) extrapolation of and length compensation in the gas counting data 0.10 percent
- (5) NBS-measured half-life value.
- (6) SRM 4361 is a dilution of SRM 4927. Recent gas-counting measurements of SRM 4927 are described in Unterweger, M.P., Coursey, B.M., Schima, F.J. and Mann, W.B., Int. J. Appl. Radiat. Isotopes, 31, 611 (1980). The reference date for this standard (SRM 4361) is the same as for the other six hydrogen-3 SRM's.

For further information call B.M. Coursey (301) 921-2383 or M.P. Unterweger (301) 921-2396.