

National Bureau of Standards

Certificate

Standard Reference Material 4266

Low-Energy Photon Standard

Radionuclide	Vanadium-49 (1)*
Source identification	4266-
K-x-ray emission rate	s ⁻¹ per steradian (2)
Reference time	1200 EST January 19, 1981
Half life	302.2 ± 2.4 days (3)
Measuring instrument	Low-geometry NaI(Tl) x-ray detector (4)
Random uncertainty	0.6 percent (5)
Systematic uncertainty	1.7 percent (6)
Total uncertainty (Random plus Systematic)	2.3 percent
Photon emitting impurities (Activity ratios at reference time in percent)	²² Na/ ⁴⁹ V: 0.26 ⁸⁸ Y/ ⁴⁹ V: 0.02 ⁵⁷ Co/ ⁴⁹ V: 6 x 10 ⁻³ ⁶⁵ Zn/ ⁴⁹ V: <6 x 10 ⁻³ ¹⁰⁹ Cd/ ⁴⁹ V: <3 x 10 ⁻³

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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FOOTNOTES

- (1) The point source support is a 5.4-cm-diameter by 1-mm-thick aluminum annulus supporting a 0.006-cm-thick layer of polyester tape. The active source is a dried deposit of vanadium-49 as the chloride, covered with a layer of polyester film 0.00038-cm thick.
- (2) Emitted perpendicular to the plane of the source mount from the side with the source identification lettering. (Also see attached information sheet).
- (3) Measured at NBS with the low-geometry NaI(Tl) x-ray detector system.
- (4) Efficiency determined with an ^{55}Fe K-x-ray emission-rate primary standard source.
- (5) Half the 99-percent confidence interval of the mean (4.6 times the standard error computed from 5 measurements).
- (6) Linear sum of estimated uncertainty limits due to:
 - a) Extrapolations of photon spectra to zero energy 0.9 percent
 - b) Calculated absorption factors due to the Be windows and the Al reflector 0.5 percent
 - c) Geometry factor 0.3 percent