U. S. Department of Commerce
Alexander B. Trowbridge
Secretary

National Bureau of Standards
A. V. Astin, Director

Certificate

Standard Reference Material 4222

Beta-Ray Standard

n-Hexadecane-1-Carbon-14

This standard consists of approximately 3 grams of carbon-14 labeled *n*-hexadecane in a flame-sealed glass ampoule.

The activity in disintegrations per second per gram of solution as of June 1967, was

$$*3.93_2 \times 10^4 \pm 3.0_5\%*.$$

Aliquots of the solution from which this standard was prepared, were converted to sodium carbonate-^{14}C and compared, by liquid-scintillation counting, with the National Bureau of Standards sodium carbonate-^{14}C standard.

The value reported above is based on 37 liquid-scintillation comparisons, and the uncertainty, $\pm 3.0_5$ percent, is the sum of the computed standard error, 0.5_5 percent, at the 99.73-percent confidence level (3.23σ), the estimated limits of the systematic error, $\pm 1.0_0$ percent, in the hexadecane-sodium carbonate conversion, and the overall uncertainty, $\pm 1.5_0$ percent, assigned to the National Bureau of Standards sodium carbonate-^{14}C standard.

The beta-ray and gamma-ray spectra were examined with anthracene-crystal and NaI(Tl)-crystal spectrometers and no radioactive impurities were observed.

A half life of 5730 ± 40 years was adopted as the best value at the Fifth Radiocarbon Dating Conference, Cambridge, England, 1962 [Nature 195, 984 (1962)].

This standard was prepared and calibrated in the Institute for Basic Standards, Radiation Physics Division, by members of the Radioactivity Section, W. B. Mann, Chief.

WASHINGTON, D.C. 20234
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W. Wayne Meinke, Chief
Office of Standard Reference Materials