



National Bureau of Standards

Certificate

Standard Reference Material 4300

Argon-37

This standard consists of argon-37 and inactive argon, at a pressure of approximately 70 cm of Hg, in a glass break-seal ampoule having a volume of about 10 milliliters.

The activity of the argon-37 in nuclear transformations per second per mole as of 1200 EST May 15, 1972, was

$$* 3.671 \times 10^6 \pm 4.2\%*$$

Twenty-four of these ampoules and a sampling flask were mounted on a manifold and filled at the same time. The gas in the sampling flask was mixed with counting gas, consisting of 90% argon and 10% methane, and the argon-37 activity measured in the National Bureau of Standards compensated internal gas counters.

The uncertainty in the decay rate, 4.2% percent, is the sum of 3.6% percent, which is the limit of the random error at the 99-percent confidence level (i.e., a Student t-factor of 5.841 times S_m , where S_m is the standard error computed from three degrees of freedom), and 0.6% percent, which is the estimated upper limit of the conceivable systematic errors in the measurements. The half-life value used in this determination was 35.1 ± 0.1 days.

In using this sample, it will be necessary to admit the argon gas into a portion of a gas-handling system of known volume and to measure both the temperature and pressure of the expanded argon. In order to calculate the number of moles of argon initially present, it will also be necessary to correct for the volume of the ampoule which may be determined subsequently.

This standard was prepared and calibrated in the Center for Radiation Research, Nuclear Radiation Division, by members of the Radioactivity Section, W. B. Mann, Chief.

Washington, D.C. 20234
May 1972

J. Paul Cali, Chief
Office of Standard Reference Materials