FORM NBS-253
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U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
WASHINGTON, D.C. 20234

B31-33(2)

NATIONAL BUREAU OF STANDARDS
REPORT OF TEST

Date May 18, 1966

Test No. 188161

Submitted by: Union Carbide Corporation
Nuclear Division, P. O. Box M
Oak Ridge, Tennessee 37831
Attn: Mr. C. C. Hayes

DESCRIPTION OF NEUTRON SOURCE: Type ^{241}Americium Beryllium (α,n)
Identifying Marks: ^{241}AmBe No. MRC-110

Neutron Producing Ingredients:	Source Container:
a) radioactive material 5 curies	a) material not available
of Americium	b) wall thickness not available
b) target material	c) geometrical shape cylinder
unknown amount of beryllium	d) outside diameter 1.00"
c) Date source sealed not available	e) height 1.56"
d) manufacturer Monsanto	f)

Other Pertinent Information expected emission rate ~ $1.2(10^7)$ n/sec.

CALIBRATION: The source described above has been calibrated by comparing its strength to that of the NBS primary Ra-Be photoneutron standard source, "NBS-I." The neutron emission rate of the submitted source was found to be 10.107±2% times that of NBS-I or $12.705(10^6)$ neutrons/sec. The standard error for this calibration of the submitted source is believed to be $\pm 0.254(10^6)$ neutrons/sec. May 2, 1966 is the reference calibration date.

EXPERIMENTAL METHOD: The comparison of source strengths was made by activating a manganese sulfate bath and counting the induced manganese-56 activity with a dip scintillation counter. The bath is cylindrically shaped with a depth and a diameter of about 100 centimeters. During activation, the source is immersed at the center of the bath. The following corrections have been applied: 3.9% for fast neutron capture by oxygen and sulfur in the bath, 0.29% for fast neutron capture by fluorine in the teflon source holder, and 1.2% for escape from the bath. The calibration data is recorded in NBS 231.22 data book No. 24 on pages 25 - 42. A small correction has been made for the decay in the emission of NBS-I, which was absolutely determined to be $1.257(10^6)$ neutrons/second on June 1961. The standard error was ±0.013 neutrons/second.

V. Spiegel, Jr.
V. Spiegel, Jr.
Neutron Physics Section

231.22
Test Source No. 104
Project No. 2310625

This calibration was performed by Clifton B. Childers.