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LAWRENCE LIVERMORE LABORATORY

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DT FUSION NEUTRON IRRADIATION OF BPNL MOLYBDENUM
AND ORNL MAGNESIUM OXIDE CRYSTAL

Unclassified

Susan C. MacLean

October 18, 1974

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DT Fusion Neutron Irradiation of BPNL Molybdenum
and ORNL Magnesium Oxide Crystal*

by

Susan C. MacLean

October 18, 1974

Dr. John L. Brimhall of Battelle Pacific Northwest Laboratories (BPNL) provided a packet of molybdenum samples to be irradiated with the LLL Rotating Target Neutron Source (RTNS). Dr. Yok Chen of Oak Ridge National Laboratory (ORNL) requested a larger fluence be accumulated on one of his magnesium oxide crystals. This crystal, labeled MgO-8, had previously been irradiated January 16-18, 1974, May 29-31, 1974, and July 16-18, 1974.

The samples were stacked with niobium dosimetry foils and taped on the front of a lucite holder in the following order:

Sample

Nb-115

Molybdenum samples in a stainless steel washer

Nb-119

MgO-8 wrapped in aluminum foil

Nb-121

Lucite holder

The irradiation was performed by the E Division Accelerator Staff on September 11, 1974. Neutron production was monitored continuously with a proton recoil counter and recorded each hour. Total beam-on time was 8.03 hours.

Both samples were retained for further irradiation. The dosimetry foils were delivered to the LLL Radiochemistry Division, and gamma ray counting was performed by Ruth Anderson. The average fluence on each dosimetry foil was computed using the method described in UCRL 51393, Rev. 1. The results were as follows:

<u>Dosimetry Foil Number</u>	<u>Average Fluence (n/cm^2)</u>
Nb-115	2.87×10^{16}
Nb-119	2.29×10^{16}
Nb-121	1.67×10^{16}

*

Work performed under the auspice of the U.S. AEC.

The estimated overall uncertainty of the results is $\pm 7.5\%$. The relative uncertainty between any two values is about $\pm 2\%$. The values given here represent average fluences over the volume of each dosimetry foil.

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