SOME COMMENTS ON THE INTERACTION OF FAST-NEUTRONS WITH BERYLLIUM*

by

M. Sugimoto,** P. T. Guenther, J. E. Lynn,*** A. B. Smith and J. F. Whalen

Argonne National Laboratory
Argonne, Illinois 60439, U. S. A.

ABSTRACT

Neutron total cross sections of elemental beryllium were measured from 1 to > 10 MeV with good precision. Differential neutron elastic-scattering cross sections were measured from 4.5 to 10 MeV at energy intervals of ≈ 0.5 MeV, and for ≈ 100 angular steps distributed between 18° and 160° at each incident energy. Concurrently, differential cross sections for the emission of a discrete inelastic-neutron group corresponding to an excited level at 2.43 ± 0.06 MeV were determined over the same incident-energy and angular range. Angle-integrated elastic-scattering cross sections were deduced from the observed differential values to accuracies of 2.5%, and angle-integrated inelastic-scattering cross sections were established to accuracies of ≤ 10%. The experimental results are compared with values given in ENDF/B-V, with attention to discrepancies and implications. Qualitative reaction mechanisms are suggested.

* This work supported by the U. S. Department of Energy under Contract W-31-109-Eng-38.

** Visiting scientist from Japan Atomic Energy Institute, Tokai, Japan.

*** Argonne Fellow, Permanent address, AERE, Harwell, United Kingdom.