FAST-NEUTRON TOTAL AND SCATTERING CROSS SECTIONS OF NIOBIUM

by

A. B. Smith, P. T. Guenther and
J. F. Whalen
Applied Physics Division
Argonne National Laboratory

ABSTRACT

Neutron total cross sections of niobium were measured from $\approx$ 0.7 to 4.5 MeV at intervals of $\lesssim$ 50 keV with broad resolution. Differerential-elastic-scattering cross sections were measured from $\approx$ 1.5 to 4.0 MeV at intervals of 0.1 to 0.2 MeV and at 10 to 20 scattering angles distributed between $\approx$ 20 and 160 degrees. Inelastically-scattered neutrons, corresponding to the excitation of levels at; 788 ± 23, 982 ± 17, 1088 ± 27, 1335 ± 35, 1504 ± 30, 1697 ± 19, 1971 ± 22, 2176 ± 28, 2456 ± (?), and 2581 ± (?) keV, were observed. An optical-statistical model, giving a good description of the observables, was deduced from the measured differential-elastic-scattering cross sections. The experimental-results were compared with the respective evaluated quantities given in ENDF/B-V.