

ANL/NDM-153

FAST NEUTRONS INCIDENT ON HAFNIUM

By

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ABSTRACT

Total neutron cross sections of elemental Hf were measured from $\approx 0.75 \rightarrow 4.5$ MeV, in steps of ≈ 40 keV and with few-keV resolutions. Differential elastic-scattering cross sections of elemental Hf were measured from $\approx 4.5 \rightarrow 10.0$ MeV, in ≈ 0.5 MeV steps and at 40 scattering angles distributed between $\approx 17^\circ$ and 160° . Some additional elastic- and inelastic-scattering results were obtained at incident energies of less than 1.5 MeV. These new data were combined with that found in the literature to obtain as comprehensive an experimental data base as possible. It was interpreted in terms of spherical-optical-statistical, coupled-channels and dispersive-coupled-channels models. The physical characteristics of the resulting potentials are discussed. These potentials are a vehicle for extrapolation, evaluation, interpolation and physical calculation for both basic and applied purposes. Comparisons are made with ENDF/B-6 (MAT 7200).