

Few-MeV NEUTRONS INCIDENT ON YTTRIUM*

by

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ABSTRACT

Neutron total and scattering cross sections of elemental yttrium are measured in the few-MeV region with broad resolutions. The total-cross-section measurements extend from ≈ 0.5 to 4.2 MeV in steps of $\lesssim 0.1$ MeV. Neutron elastic- and inelastic-scattering cross sections are measured from ≈ 1.5 to 4.0 MeV, at incident-neutron energy intervals of $\lesssim 50$ keV and at ten or more scattering angles distributed between 20 and 160 deg. Inelastically-scattered neutron groups are observed corresponding to the excitation of levels at 909 ± 23 , 1504 ± 20 , 1747 ± 16 , 2224 ± 16 , 2567 ± 26 , 2889 ± 12 and 3104 ± 10 keV. The experimental results are discussed in terms of the spherical optical-statistical, coupled-channels and core-coupling models and compared with corresponding quantities given in the evaluated nuclear data file ENDF/B-V.

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