

NEUTRON TOTAL AND SCATTERING CROSS SECTIONS OF  
 ${}^6\text{Li}$  IN THE FEW MeV REGION\*

by

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ABSTRACT

Neutron total cross sections of  ${}^6\text{Li}$  are measured from  $\sim 0.5$  to  $\sim 4.8$  MeV at intervals of  $\lesssim 10$  keV. Neutron differential elastic-scattering cross sections are measured from 1.5 to 4.0 MeV at  $\gtrsim 10$  scattering angles and at incident-neutron intervals of  $\lesssim 100$  keV. Neutron differential inelastic-scattering cross sections are measured in the incident-energy range 3.5 to 4.0 MeV. The experimental results are extended to lower energies using measured neutron total cross sections recently reported elsewhere by the authors. The composite experimental data (total cross sections from 0.1-4.8 MeV and scattering cross sections from 0.22-4.0 MeV) are interpreted in terms of a simple two-level R-matrix model which describes the observed cross sections and implies the reaction cross section in unobserved channels; notably the  $(n;\alpha)t$  reaction ( $Q = 4.783$  MeV). The experimental and calculational results are compared with previously reported results as summarized in the ENDF/B-V evaluated nuclear data file.

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