

^{90}Zr and ^{92}Zr ; Neutron Total and
Scattering Cross Sections^a

by

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Abstract

Total neutron cross sections of ^{90}Zr and ^{92}Zr were measured from 0.9 to 5.5 MeV and elastic and inelastic neutron scattering cross sections from 1.8 to 4.0 MeV. The inelastic neutron excitations of six states in ^{90}Zr and more than twelve in ^{92}Zr were observed. The experimental results formed the basis of an optical-statistical model interpretation including considerations of the $\left[\frac{N-Z}{A}\right]$ and shell dependence of the optical potential and the effects of resonance width-fluctuation and interference. Comparisons of measured and calculated cross sections suggested new J^π assignments for a number of excited states. The experimental and calculational results were incorporated into a limited evaluated data file in the ENDF format including total and scattering cross sections to from 0.8 to 8.0 MeV.

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