

MEASUREMENTS OF $^{142,144}\text{Nd}(n,\gamma)$ CROSS SECTIONS AT ORELA FOR ASTROPHYSICAL s -PROCESS STUDIES

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We have completed measurements of the $^{142,144}\text{Nd}(n,\gamma)$ cross sections from approximately 20 eV to 200 keV at the Oak Ridge Electron Linear Accelerator (ORELA) using a recently improved C_6D_6 detector apparatus. ^{142}Nd is an s -only isotope, i.e. it is only formed during the s process. It has a closed neutron shell and therefore defines a step in the $\langle\sigma\rangle N_s$ curve from which the mean s -process neutron exposure can be calculated. In addition, ^{144}Nd is the normalization point for the neodymium abundances. Also accurate (n,g) cross sections would help to determine the r - and p -process residuals of these isotopes and will impact the interpretation of the recently discovered isotopic anomalies in silicon carbide grains from the Murchison meteorite. Our new (n,γ) cross sections also show that reaction rate extrapolations for nuclei near closed neutron shells from measured values at 30 keV down to 8 keV can be inaccurate. .

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