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Radiative Capture Cross Sections of ^{139}La(n,γ) for Thermal Neutrons ADRIANA URECHE, University of California, Berkeley, AARON M. HURST, Lawrence Berkeley National Laboratory, BETHANY L. GOLDBLUM, JASMINA VUJIC, University of California, Berkeley, RICHARD B. FIRESTONE, SHAMSUZZOHA BASUNIA, Lawrence Berkeley National Laboratory, ZSOLT REVAY, LASZLO SZENTMIKLOSI, TAMAS BELGYA, Centre of Energy Research, Hungarian Academy, NEIL C. SUMMERS, LEE A. BERNSTEIN, DARREN L. BLEUEL, JUTTA E. ESCHER, BRADLEY W. SLEAFORD, Lawrence Livermore National Laboratory, MILAN KRTICKA, Charles University in Prague — A set of partial-production neutron-capture γ-ray cross sections corresponding to the $^{139}\mathrm{La}(n,\gamma)$ reaction were measured at the Budapest Research Reactor using a supermirror-guided near-thermal neutron beam. Absolute values for these quantities were obtained through an internal-standardization procedure where the observed γ-ray intensities were normalized to well-known comparator $^{35}\mathrm{Cl}(n,\gamma)$ transitions using a $\mathrm{LaCl_3 \cdot 7H_2O}$ standard. These measurements have been used, together with statistical-model predictions calculated using the Monte Carlo program DICEBOX to simulate the thermal-capture γ-ray cascade, to evaluate the decay scheme of the compound nucleus ^{140}La. An independent measurement of the total radiative thermal neutron-capture cross section, σ_0, has also been determined; our preliminary result $\sigma_0 = 8.51(43)$ b, is consistent with earlier literature. The total mean capture-state width is currently being investigated and may provide further insight into the validity of the Brink hypothesis in γ decay.

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