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Production of ^{178m2}Hf Isomeric Nuclei with High Energy Monoenergetic Neutrons[1] M. PARKER, University of Minnesota and TUNL, A. TONCHEV, B. FALLIN, W. TORNOW, A. HUTCHESON, Duke University and TUNL, J. KELLEY, NC State University and TUNL, J. CLARK, Hillsdale College and TUNL — The 31-year high-spin isomeric state ^{178m2}Hf ($J^{\pi}= 16^{+}$) provides an opportunity to study high-spin nuclear structure phenomena as well as future energy storage opportunities. Unfortunately, experimental data on its population via neutron induced reactions is very scarce. In order to study the yield of this isomer in the ^{179}Hf(n,2n)^{178m2}Hf reaction, monoenergetic neutrons of energies 10, 12 14, 16, and 18 MeV from the TUNL tandem accelerator were produced and impinged on a ^{nat}Hf target sandwiched between Al and Ag foils serving as monitors. The residual activity of the irradiated Hf and monitor foils was measured with a shielded HPGe detector. To provide better understanding of the population and decay of levels in Hf, complementary in-beam measurements of γ-ray emissions were also taken at E_n = 12.5 MeV using BGO-shielded clover HPGe detectors. Analysis of these spectra allow the determination of the (n,2n) production cross sections of ^{178m2}Hf.

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