Abstract Submitted
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Measurement of the Total Cross-Section for the ^{9}Be(γ,nα)α reaction[1] C.W. ARNOLD, T.B. CLEGG, H.J. KARWOWSKI, UNC Chapel Hill, TUNL, C.R. HOWELL, G. RUSEV, A.P. TONCHEV, Duke U., TUNL — The ^{9}Be(γ,nα)α cross section is key to understanding isotopic abundances of nuclei produced during the r-process. The inverse reaction bridges the unstable mass gaps at A = 8 leading to α(αn,γ)^{9}Be(α,n)^{12}C and so on, producing seed nuclei for the r-process and setting the neutron-to-seed nucleus ratio that drives universal isotopic abundance predictions [Ref 1,2]. In order to make high precision measurements ($\pm$ 5%) of the ^{9}Be(γ,nα)α cross-section which includes narrow resonances, a tunable gamma ray beam with small ΔE/E is required along with gamma and neutron detectors whose efficiencies are well known. We used TUNL's high intensity gamma ray source (HIγS) to measure the cross sections for ^{9}Be(γ,n) in the energy range of 1.55 to 5.0 MeV with beam energy resolutions between 14 and 150 keV as determined by large Ge detector. The neutrons were detected using ^{3}He proportional counter. The most recent experimental results as well as their astrophysical consequences will be presented. [Ref 1] B. Meyer *et al.*, Astro J., **399** 656-664 (1992). [Ref 2] T. Kajino *et al.*, Nuc. Phys. A, **704**, 165c-178c (2002)

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