## Abstract Submitted for the DNP19 Meeting of The American Physical Society

26Mg(alpha,n) and Br(n,gamma) Cross Section Measurements CECILIA FASANO, KRISTIN RINGHAND, University of Notre Dame, MEIKO VOLKNANDT, BENJAMIN BRUECKNER, RENE REIFARTH, Goethe University, Frankfurt, MICHAEL WIESCHER, University of Notre Dame — The cross sections of two different reactions were measured using the 2.5 MeV Van de Graaff accelerator at Goethe University, Frankfurt to parameterize varying stellar processes associated with understanding the origin of elements in the universe. <sup>26</sup>Mg ( $\alpha$ ,n) was measured using a proton beam over a beam energy range of 1.8-2.0 MeV. A <sup>3</sup>He spectrometer counted neutrons between the thermal region and reaction region from which yields and cross sections were calculated. Cross sections from this reaction will provide a constraint on neutron flux in stellar environments. To provide a constraint on stellar processes which occur in environments with lower neutron density,  $Br(n,\gamma)$  activation and decay rates were similarly investigated. The number of activated nuclei as a function of energy was determined using gamma spectroscopy and germanium detectors. Ten minute activations of natural bromine led to cross section measurements of Bromine isomers with most focus on  $^{82}$ Br which has a half life of minutes and requires sensitive detectors to measure. A more rigorous understanding of this cross section will help constrain the stellar s-process especially in our own sun. Together these two reactions provide better context for current astrophysical models and theories.

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