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Measurement of the $^{25}Mg(\alpha$,n)^{28}Si reaction cross-section at low energy[1] SHAHINA SHAHINA, A. BOELTZIG, R.J. DEBOER, K.T. MACON, M. WIESCHER, University of Notre Dame, M. FEBBRARO, Oak Ridge National Laboratory, R. TOOMEY, Rutgers University — There is uncertainty regarding the available neutron flux for the weak s-process in massive stars. In order to correctly model the s-process nucleosynthesis, one key ingredient is the rate of neutron producing reactions. The ^{22}Ne$(\alpha, n)^{25}$Mg is the main neutron source, but other reactions also contribute. In the present work we study one such reaction, namely ^{25}Mg$(\alpha, n)^{28}$Si, which acts as a potential neutron source for weak s-process and destroys the strongest neutron poison ^{25}Mg. Previous measurements for this reaction suffered from two shortcomings: they were not performed at low enough energies relevant for weak s-process in massive stars and measurements using neutron counters were hindered by the contamination of targets with lower Z material. In this work, we used two different setups consisting of deuterated liquid scintillator detectors for neutrons and $LaBr_3$ for γ-rays in order to measure the ^{25}Mg$(\alpha, n)^{28}$Si cross-section in the Gamow range 1.4-2.6 MeV. The neutron spectroscopy was performed via neutron spectrum unfolding technique which allows for a clear separation of the signal and the background. Preliminary results, including cross-sections determined from gamma-ray and neutron spectroscopy will be presented.

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