

Abstract Submitted
for the DNP06 Meeting of
The American Physical Society

Cross section measurements of ${}^9\text{Be}(\alpha, \text{n}){}^{12}\text{C}$ Z. HEINEN, A. ADEKOLA, C.R. BRUNE, S.M. GRIMES, H. HADIZADEH, M.J. HORNISH, T.N. MASSEY, C. MATEI, A. VOINOV, Ohio University — The ${}^9\text{Be}(\alpha, \text{n}){}^{12}\text{C}$ reaction has a large cross section and hence is useful in applications as a neutron source. This reaction is also a key step in the formation of ${}^{12}\text{C}$ in neutron-rich environments, such as the ejecta of type-II supernovae. Using the 4.5-MV tandem accelerator at Ohio University, the differential cross section of ${}^9\text{Be}(\alpha, \text{n}){}^{12}\text{C}$ has been measured for an incident energy of $E_\alpha = 4.5$ MeV. The time-of-flight method was used with a flight path of 30 m. A 15- μm -thick target of ${}^9\text{Be}$ was used. This thickness yielded broad peaks in the neutron energy spectra which allowed the energy dependence of the cross section to be inferred for $2 \leq E_\alpha \leq 4.5$ MeV. Using a beam swinger apparatus, neutrons were detected at laboratory angles of 0° , 15° , 35° , 40° , 60° , 88° , 110° , 120° , 130° , and 145° . Neutrons associated with the ground state and the first two excited states of ${}^{12}\text{C}$ were measured. I will present the cross section data and discuss its implications.

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Date submitted: 23 Jun 2006

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