Cross section measurements of $^9\text{Be}(\alpha, n)^{12}\text{C}$ 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 $^9\text{Be}(\alpha, n)^{12}\text{C}$ 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 $^9\text{Be}(\alpha, n)^{12}\text{C}$ 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-$\mu$m-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 $0^\circ$, $15^\circ$, $35^\circ$, $40^\circ$, $60^\circ$, $88^\circ$, $110^\circ$, $120^\circ$, $130^\circ$, and $145^\circ$. 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.