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Cross Section Measurement of the $^{12}\text{C}(^6\text{Li}, \text{d})^{16}\text{O}$ Reaction and the $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$ Reaction SHAMIM AKHTAR, CARL BRUNE, Ohio University
— The $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$ reaction is a very important reaction for the understanding of the helium burning in massive stars. However, despite many experimental studies, the low-energy cross-section of the $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$ reaction remains highly uncertain. In view of the importance of $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$ reaction, a new determination of the $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$ reaction cross-section has been performed via a measurement of the transfer reaction $^{12}\text{C}(^6\text{Li}, \text{d})^{16}\text{O}$ at the Edwards Accelerator Laboratory at the Ohio University. The differential cross-section of the $^{12}\text{C}(^6\text{Li}, \text{d})^{16}\text{O}$ reaction has been measured to the 0^+ (6.05 MeV), 3^- (6.13 MeV), 2^+ (6.92 MeV), and 1^- (7.12 MeV) states of ^{16}O with ^6Li beams of 3-, 4-, and 5-MeV. The cross-section measurements were done by detecting the deuterons. The time of flight method was used to separate the different particles.

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