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Cross Section Measurement of the ^{12}C(^{6}Li, d)^{16}O Reaction and the ^{12}C(α, γ)^{16}O Reaction SHAMIM AKHTAR, CARL BRUNE, Ohio University — The ^{12}C(α, γ)^{16}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}C(α, γ)^{16}O reaction remains highly uncertain. In view of the importance of ^{12}C(α, γ)^{16}O reaction, a new determination of the ^{12}C(α, γ)^{16}O reaction cross-section has been performed via a measurement of the transfer reaction ^{12}C(^{6}Li, d)^{16}O at the Edwards Accelerator Laboratory at Ohio University. The differential cross-section of the ^{12}C(^{6}Li, d)^{16}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 ^{6}Li 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.

Shamim Akhtar
Ohio University

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