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Cross Section Measurements of the ^{12}C$(\alpha,\gamma)^{16}$O Reaction at $E_{c.m.}$ = 3.7, 4.0, and 4.2 MeV[1] REKAM GIRI, CARL R. BRUNE, SOM NATH PANERU, Ohio Univ, DEVIN S. CONNOLLY, BARRY DAVIDS, DAVE A. HUTCHEON, ANNIKA LENNARZ, LARS MARTIN, CHRIS RUIZ, TRIUMF, Vancouver, BC, Canada, UWE GREIFE, Colorado School of Mines, Golden, CO, ULRIKE HAGER, Michigan State University, East Lansing, MI, GREG CHRISTIAN, Texas A&M University, AHMED HUSSEIN, University of Northern British Columbia, BC, Canada — The ^{12}C$(\alpha,\gamma)^{16}$O reaction is one of the most important nuclear reactions in astrophysics, as it determines the C/O ratio at the end of the helium burning in red giant stars. This ratio has significant effects for the subsequent stellar evolution and supernova explosions. We have used the DRAGON recoil separator for the measurements of the ^{12}C$(\alpha,\gamma)^{16}$O reaction at the higher energies of $E_{c.m.} = 3.7, 4.0$, and 4.2 MeV. The measurements will constrain global R-Matrix fits by providing information on high energy levels, aiding the extrapolation to helium burning energies. The experiment was performed in inverse kinematics where a ^{12}C beam was impinged on windowless He gas target surrounded by 30 BGO detectors which detect the γ-rays. The ^{16}O recoils were detected by a double-sided silicon strip detector located at the end of the DRAGON separator. The array of BGO detectors is able to separate transitions to various ^{16}O final states.

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