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Cross Section Measurements of ^{12}C+^{16}O Fusion Reaction at Stellar Energies[1] WANPENG TAN, X FANG, M BEARD, G GILARDY, H JUNG, Q LIU, S LYONS, D ROBERTSON, K SETOODEHNIA, C SEYMOUR, E STECH, B VANDE KOLK, M WIESCHER, University of Notre Dame, R DE SOUZA, S HUDAN, V SINGH, Indiana University Bloomington, X TANG, Institute of Modern Physics, Chinese Academy of Science, E UBERSEDER, Texas A&M University
— ^{12}C+^{16}O is one of the three fusion reactions (^{12}C+^{12}C, ^{12}C+^{16}O, and ^{16}O+^{16}O) that play an important role at the late stage of stellar evolution in massive stars. The previous meassurements of its cross section at low energies rely on the singles measurements of either gamma rays or charged particles. New measurement was conducted for the ^{12}C+^{16}O reaction at E_{cm} = 3.64 - 4.93 MeV with the detection of both gammas and charged particles using the high intensity St ANA accelerator at the University of Notre Dame. The protons and alphas from the fusion evaporation were measured by a large area silicon strip detector array (SAND) while the gamma rays were detected by one large volume HPGe detector right after the target. Statistical model calculation were employed to interpret the experimental results. This provided a more reliable extrapolation for the 12C+16O fusion cross section, reducing substantially the uncertainty for stellar model simulations.

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