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Inelastic Scattering of Alphas on ^{24}Mg as a Surrogate for Stellar Carbon Burning JUSTIN MUNSON, University of California-Berkeley, ERIC NORMAN, University of California-Berkeley; Lawrence Livermore National Laboratory, JASON BURKE, ROBERT CASPERSON, Lawrence Livermore National Laboratory, ELLEN MCCLESKEY, Texas A&M University, MATT MCCLESKEY, None, RICHARD HUGHES, SHUYA OTA, Lawrence Livermore National Laboratory, AGNIESZKA CZESZUMSKA, University of California-Berkeley; Lawrence Livermore National Laboratory, ANTTI SAASTAMOINEN, ALEX SPIRIDON, Texas A&M University — Inelastic excitation of ^{24}Mg is used as a surrogate for the $^{12}C+^{12}C$ reaction at stellar energies. The branching ratio for $^{12}C+^{12}C \rightarrow^{20} Ne+\alpha$ and $^{12}C+^{12}C \rightarrow^{23} Na+p$ is determined by the ratio of decays via the alpha and proton decay channels of the excited ^{24}Mg. An experiment was conducted at the Texas A&M Cyclotron Institute in November of 2014 using the STARLiTeR detector array and the K150 (88") Cyclotron. The experiment used a 40 MeV alpha beam and a thin ^{24}Mg target. The scattered alpha and the ejected alpha or proton were detected using silicon detectors while gammas from the often excited daughters were detected using an array of germanium "clover" detectors. This work was supported in part by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344; Texas A&M under DOE Office of Nuclear Physics grant DE-FG02-93ER40773 and NNSA grants DE-FG52-09NA29467 and DE-NA0000979.

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