DECAY BRANCHING RATIOS OF EXCITED STATES IN ^{24}MG RELEVANT FOR CARBON BURNING

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^{12}C(^{12}C, α)^{20}Ne, ^{12}C(12C,p)^{23}Na, and ^{12}C(^{12}C,n)^{23}Mg are the primary reactions in carbon burning, which occurs in the later stages of evolution of massive stars. The Gamow window for carbon burning, which describes the energy range where most of these reactions take place, is typically around 1.5 MeV. Direct measurements of the cross sections at this energy are difficult due to the large Coulomb barrier between the carbon nuclei. However, a surrogate measurement can be used to determine the branching ratios for these three final states. We performed such an experiment using inelastic scattering of 40 MeV alpha particles on ^{24}Mg. The inelastically scattered alpha and the subsequently ejected alpha or proton were detected using position-sensitive silicon detectors, while gamma rays from excited daughter nuclei were detected using an array of germanium clover detectors. Branching ratios for the alpha, proton, and neutron exit channels will be presented and compared to those obtained from previous direct measurements from ^{12}C + ^{12}C fusion reactions.