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Cross Section of the (n, 2n) Reaction in ^{12}C in the Energy Interval 20-30 MeV STEPHEN PADALINO, DANAE POLSIN, MEGAN RUSS, MICHAEL KRIEGER, MOLLIE BIENSTOCK, DREW ELLISON, ANGELA SIMONE, COLLIN STILLMAN, SUNY Geneseo, MARK YULY, KEITH MANN, TYLER REYNOLDS, Houghton College, CRAIG SANGSTER, Laboratory for Laser Energetics — The behavior of the (n, 2n) reaction in ^{12}C and other light nuclei is known with much less certainty than for heavy nuclei. The published cross section data for the ^{12}C(n, 2n)^{11}C reaction is bifurcated in the energy range of 20-30 MeV. An experiment to measure the ^{12}C(n, 2n)^{11}C cross section for these neutron energies has been performed using the Ohio University Tandem Accelerator. Deuterons from the accelerator struck a tritium foil releasing neutrons via the T(d, n)^{4}He reaction. Deuteron bombarding energies between 3.3-8.7 MeV resulted in neutrons with energies between 20-26 MeV. The geometry of the experiment was chosen so that the incident neutron energy would not vary by more than 0.5 MeV across the graphite target. After neutron bombardment, the decay of the ^{11}C nuclei by positron emission was measured with an array of NaI detectors to determine the activity of the carbon sample. The neutron fluence through the carbon was measured using a particle telescope to detect protons from the ^{1}H(n, p) reaction in a polyethylene target, allowing the absolute cross section for the ^{12}C(n, 2n)^{11}C reaction to be determined. Funded in part by a grant from the DOE through the Laboratory for Laser Energetics.

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