

Abstract Submitted
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Determining Neutron Scattering Cross Sections of ^{12}C ¹ ELIZABETH CHOUINARD, University of Dallas — At the University of Kentucky Accelerator Lab (UKAL), experiments were done to determine neutron elastic and inelastic scattering differential cross sections for ^{12}C . The results of these measurements not only enhance our knowledge of how neutrons interact with a ^{12}C nucleus but also provide valuable information for the next generation of nuclear reactors, i.e., Gen IV reactors. Carbon and carbon materials serve as constituents in several of the Gen IV reactor designs as fuel coatings, moderators, control rods, etc. In the experiments at UKAL, a 7 MV model CN Van de Graaff accelerator was used to generate a pulsed proton beam which then interacted with tritium or deuterium to produce nearly monoenergetic neutrons through the $^3\text{H}(p,n)^3\text{He}$ or the $^2\text{H}(d,n)^3\text{He}$ reactions. Using time-of-flight techniques, these neutrons scattered off a carbon sample and were detected with an EJ310 liquid scintillator detector and a C_6D_6 liquid scintillator detector. Angular distributions of 0.29, 0.51, 7.25, and 7.75 MeV scattered neutrons were deduced from the measurements. Results from these measurements, along with comparisons to theoretical data evaluations from the National Nuclear Data Center (NNDC) will be presented.

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