

Abstract Submitted
for the DNP17 Meeting of
The American Physical Society

Neutron capture cross-section measurements for ^{238}U between 0.4 and 1.4 MeV FNU KRISHICHAYAN, S.W. FINCH, C.R. HOWELL, TUNL/Duke University, A.P. TONCHEV, LLNL, W. TORNOW, TUNL/Duke University — Neutron-induced radiative-capture cross-section data of ^{238}U are crucial for fundamental nuclear physics as well as for Stewardship Science, for advanced-fuel-cycle calculations, and for nuclear astrophysics. Based on different techniques, there are a large number of $^{238}\text{U}(n,\gamma)^{239}\text{U}$ cross-section data available in the literature. However, there is a lack of systematic and consistent measurements in the 0.1 to 3.0 MeV energy range. The goal of the neutron-capture project at TUNL is to provide accurate $^{238}\text{U}(n,\gamma)^{239}\text{U}$ cross-section data in this energy range. The ^{238}U samples, sandwiched between gold foils of the same size, were irradiated for 8-14 hours with monoenergetic neutrons. To avoid any contribution from thermal neutrons, the ^{238}U and ^{197}Au targets were placed inside of a thin-walled pill-box made of ^{238}U . Finally, the whole pill-box was wrapped in a gold foil as well. After irradiation, the samples were gamma-counted at the TUNLs low-background counting facility using high-efficient HPGe detectors. The ^{197}Au monitor foils were used to calculate the neutron flux. The experimental technique and $^{238}\text{U}(n,\gamma)^{239}\text{U}$ cross-section results at 6 energies will be discussed during the meeting.

Werner Tornow
TUNL/Duke University

Date submitted: 30 Jun 2017

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