



ID: P3.6-701

Type: E-poster

estimates of production rates of ^{37}Ar by measuring the thermal neutron cross section of the $^{40}\text{Ca}(n,\alpha)^{37}\text{Ar}$ reaction

Argon-37 is a signature of interest for nuclear explosion monitoring because its longer half-life compared to radioxenon isotopes provides a longer detection window and it is produced in underground nuclear explosions (UNEs) with high enough activity to be detected using current detection systems. ^{37}Ar is produced in UNEs through the neutron activation of ^{40}Ca in rock and soil. The thermal neutron cross section for the $^{40}\text{Ca}(n,\alpha)^{37}\text{Ar}$ reaction is poorly characterized, with the Evaluated Nuclear Data File (ENDF) and the Japanese Evaluated Nuclear Data Library (JENDL) disagreeing on what occurs at low energies. Improving the nuclear data by measuring the $^{40}\text{Ca}(n,\alpha)^{37}\text{Ar}$ thermal cross section supports the characterization of ^{37}Ar production from UNEs for on-site inspections. To measure the cross section, an experiment was designed and conducted at the University of Texas using a monoenergetic cold neutron beam. Prompt alpha spectroscopy was used to measure the cross section.

E-mail

khiloni.shah@austin.utexas.edu

In-person or online preference

Primary authors: HAAS, Derek (The University of Texas at Austin); LAPKA, Joseph (The University of Texas at Austin); Ms SHAH, Khiloni (The University of Texas at Austin)

Presenter: Ms SHAH, Khiloni (The University of Texas at Austin)

Session Classification: P3.6 Analysis of Radionuclide Monitoring Data

Track Classification: Theme 3. Monitoring and On-Site Inspection Technologies and Techniques: T3.6 Analysis of Radionuclide Monitoring Data