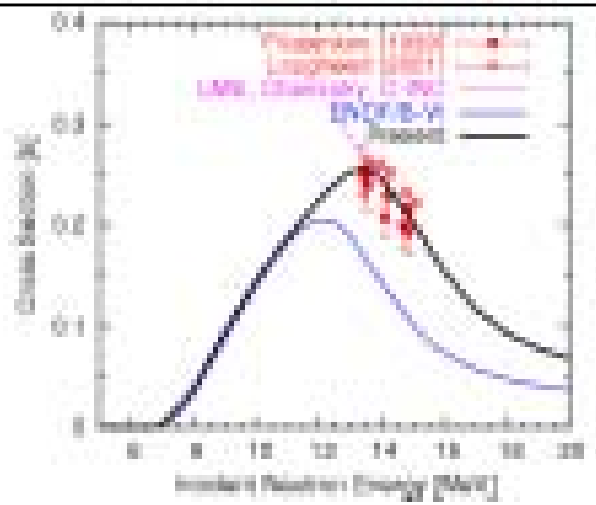
Americium nuclear data for Attribution

NA22 / NNSA project: Forensic Capability for Post-Nuclear-Event Attribution

Unclassified



Description

Americium (^{241}Am) is a contaminant in plutonium

Measurements of radiochemical signatures after a nuclear explosion can provide information on:

- pre-event isotopics & technology level

We are developing nuclear cross sections for a new simulation capability for post-event attribution

Synergy with DTRA, DHS, and NNSA/DP projects
Team: T-16, X-5, X-4, X-2, C

Progress/issues

^{241}Am(n,2n) has been re-evaluated – new measurements and systematics, together with nuclear theory predictions used.

^{241}Am(n,γ) re-evaluated, especially the branching between the ^{242}Am isomer and ground state

First cross section chain for isotopes implemented, and first demonstration completed in LANL simulation codes

Future

^{240}Am is being evaluated this FY. No measurements exist (short-lived). Nuclear theory is very important, together with Younes-Britt LLNL analysis of LANL surrogate fission data

Improved ^{242g,242m}Am, ^{243}Am cross sections will be developed. A LANSCE measurement of ^{241}Am(n,γ) is desirable, with the new DANCE detector

Mark Chadwick, 505-667-9877 mbchadwick@lanl.gov

Los Alamos National Laboratory