

2.4-P08. Non-traditional Radioxenon Isotope Measurements

To ensure compliance with the CTBT, it is crucial to have advanced monitoring technologies for the detection of nuclear testing, but also to ensure that detected signals are well understood. Traditionally, Xe-131m, Xe-133m/g, and Xe-135 originating from the fission of heavy nuclei (e.g. U-235, Pu-239) are analyzed in the context of CTBT verification. This project explores non-traditional radioxenon isotopes to provide a better understanding of civilian background sources by looking at radioxenon from neutron activation (e.g. research reactors) rather than just fission. Stable xenon in air will activate to radioxenon isotopes during a nuclear explosion. Xe-125, Xe-127, Xe-129m, and Xe-137 were produced in isotopically pure samples via neutron activation at the University of Texas at Austin Nuclear Engineering Teaching Lab's TRIGA MARK II Reactor. The samples were measured in an ARSA-style beta-gamma coincidence detector. Isotopically pure beta-gamma spectra of these non-traditional isotopes will be presented and analyzed. Xe-127 has also been considered for calibration, QA/QC and tracer for medical isotope production facilities.

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