NE-23-31236 – ICP-MS for Analysis of Lithium Isotopic Ratios in Materials Highly Enriched in 7Li

Kairos Power, located in Alameda, CA, is a nuclear energy technology and engineering company whose mission is to enable the world's transition to clean energy, with the ultimate goal to dramatically improve quality of life, while protecting the environment.

The Kairos Power fluoride-salt-cooled, high-temperature reactor requires highly enriched lithium-7 to support operations. The high enrichment requirements complicate quality and process control due to lack of qualified standards and instrumentation capable of meeting the required precision and accuracy. Currently, enrichment of 99.95% ^{7}Li is imported to the U.S. in limited quantities. The goal of this project would be to evaluate performance capabilities of instruments and develop standardized hardware configurations and operating procedures to analyze lithium isotopic ratios to support production of Flibe coolant that is highly enriched in ^{7}Li.

Kairos will work the Pacific Northwest National Laboratory (PNNL), which has both the researchers and the instruments required to perform this work, specifically the ThermoFisher Neoma MC-ICP-MS. Accurate and rapid lithium isotopic ratio measurements will allow Kairos to move toward production of highly enriched lithium for its reactor.