

**2018 Mo-99 TOPICAL MEETING ON
MOLYBDENUM-99 PRODUCTION TECHNOLOGY DEVELOPMENT**

**SEPTEMBER 23-26, 2018
HILTON KNOXVILLE HOTEL
KNOXVILLE, TN**

Irradiation Activities at ORNL for Supporting R&D on ⁹⁹Mo Production

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ABSTRACT

Molybdenum-99 (⁹⁹Mo) is an isotope used in over 40,000 medical procedures in the United States every day. Recent research efforts aim to develop safe and viable options for the production of ⁹⁹Mo for the future. Each year, the National Nuclear Security Administration funds national laboratories to conduct research and development (R&D) for ⁹⁹Mo production. Over the years, Oak Ridge National Laboratory (ORNL) has supported these efforts by assisting many of the cooperative agreement partners such as NorthStar, SHINE, GE-Hitachi, and more recently, Coqui and BXWT. The work at ORNL includes R&D irradiations in the High Flux Isotope Reactor (HFIR) to investigate irradiation effects on the mechanical properties of hydrided Zircaloy-4 for SHINE's vessel material qualification, assistance with target design, and analysis and qualification for supporting Coqui in the construction of the isotope processing facility in Oak Ridge, Tennessee. ORNL also supports an activity to provide irradiated natural molybdenum targets to BXWT for the purpose of post-irradiation chemical processing tests. This paper briefly discusses these irradiation designs and provides a summary of ongoing activities in support of the work for SHINE, Coqui and BXWT.