

**Mo-99 2015 TOPICAL MEETING ON
MOLYBDENUM-99 TECHNOLOGICAL DEVELOPMENT**

**AUGUST 31-SEPTEMBER 3, 2015
HILTON BOSTON BACK BAY
BOSTON, MASSACHUSETTS**

SCALABILITY OF THE LEU-MODIFIED CINTICHEM PROCESS

D. A. Rotsch, P. Tkac, V. Makarashvili, K. Quigley, R. Gromov, L. Hafenrichter,
G. F. Vandegrift

Nuclear Engineering Division
Argonne National Laboratory, 9700 S Cass Ave, 60439 Argonne – USA

ABSTRACT

Argonne National Laboratory with the National Nuclear Security Administration's (NNSA) Material Minimization and Management program (M³), in partnership with SHINE Medical Technologies are developing technologies for the domestic production of ⁹⁹Mo. SHINE is planning to produce ⁹⁹Mo by fission of low enriched uranium (LEU) in a subcritical aqueous solution using accelerator-based neutron generation. In support of this goal, irradiations at Argonne's Van-de-Graaff facility simulating LINAC irradiations were performed. The LEU-Modified Cintichem process has been chosen by SHINE to process their irradiated solutions. However, Cintichem rarely processed more than 1000 Ci of ⁹⁹Mo in a single batch. A concern is the Mo-ABO complex will break down under high dose conditions, causing a decrease in the recovery of ⁹⁹Mo. Irradiations of the Mo-ABO solid have been performed and the results will be discussed.

Work supported by the U.S. Department of Energy, National Nuclear Security Administration's (NNSA's) Office of Defense Nuclear Nonproliferation, under Contract DE-AC02-06CH11357. Argonne National Laboratory is operated for the U.S. Department of Energy by UChicago Argonne, LLC.