

**2017 Mo-99 TOPICAL MEETING ON  
MOLYBDENUM-99 PRODUCTION TECHNOLOGY DEVELOPMENT**

**SEPTEMBER 10-13, 2017  
MONTREAL MARRIOTT CHATEAU CHAMPLAIN  
MONTREAL, QC CANADA**

**Medical Isotope Production in Liquid-Fluoride Reactors**

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**ABSTRACT**

Liquid-fluoride reactors use a mixture of fluoride salts held above their melting point as the medium for fission reactions as well as primary thermal transport. Fission products of all sorts are chemically accessible. Noble metals (including molybdenum) and noble gases (including xenon) are particularly easy to separate, and continuous separation is required for normal reactor operation. The primary mission of these reactors is electrical power generation, nevertheless, demonstration systems that will be built in the nearer-term will likely produce substantial amounts of medical isotopes. Removal of noble metals from liquid-fluoride reactors was inadvertently demonstrated during the operation of the Molten-Salt Reactor Experiment at Oak Ridge National Laboratory from 1965-1969, but at this time the value proposition for molybdenum-99 was not established. The eventual deployment of large numbers of this reactor type will make large quantities of medical isotopes available at low costs for the indefinite future.