made with millibarn cross sections by a number of nuclear reactions between light or heavy ions with actinide target nuclei. We have found that the bombardment of fractions of a microgram of ^{254}Es with intense alpha-particle beams will produce ~10^6 atoms of ^{256}Md in one to two hours of irradiation time. The ^{256}Md is most easily detected through spontaneous fission arising from the ingrowth of its electron-capture daughter ^{256}Fm. A difficulty with using spontaneous-fission counting to determine the Md content of samples is that the growth and decay of fission radioactivity in each sample must be followed with time in order to resolve the amounts of Md and Fm initially present. However, alpha-particles of a distinctive energy coming from a 10% alpha-decay branch can also be used to identify ^{256}Md in a mixture of actinide tracers.

Mendelevium and Fm metal were found to be more volatile than other actinide metals. In the numerous thermochromatographic studies by Zvara and coworkers,[1] the evaporation of Fm and Md tracer from molten La at 1150°C was compared with the behavior of other selected lanthanides and actinides. The volatility of Md and Fm was found to be greater than that of Cf, Cf was about equivalent to Yb and Eu, and all were much more volatile than Am. The volatilities are correlated by the number and energy of the valence bands minus the energy needed to promote electrons to the valence bands in the metals. Therefore, within the normally trivalent lanthanides and actinides, the more volatile elements are associated with the divalent metals. The unusual volatility of Fm and Md was then construed by Zvara as evidence for divalency in the metallic state.