The bombardment took place in the Berkeley 60-inch cyclotron after which the material was shipped to the Metallurgical Laboratory at Chicago for chemical separation and identification. The crucial step in the identification of the α-emitting nuclide as an isotope of element 96, $^{242}_{96}Cm$, was the identification of the known $^{238}_{94}Pu$ as the α-decay daughter of the new nuclide.

The identification of an isotope of element 95, in late 1944 and early 1945, followed after the identification of this isotope of element 96 (^{242}Cm) as a result of the bombardment of $^{239}_{94}Pu$ with neutrons in a nuclear reactor(13). The production reactions, involving multiple neutron capture by plutonium are:

$$^{239}_{94}Pu + ^{1}_{0}n \rightarrow ^{240}_{94}Pu + \gamma$$

$$^{240}_{94}Pu + ^{1}_{0}n \rightarrow ^{241}_{94}Pu + \gamma$$

$$^{241}_{94}Pu \xrightarrow[t_{1/2} = 14.4y]{\beta^-} ^{241}_{95}Am \ (t_{1/2} = 432.7y)$$

$$^{241}_{95}Am + ^{1}_{0}n \rightarrow ^{242}_{95}Am + \gamma$$

$$^{242}_{95}Am \xrightarrow[t_{1/2} = 16.0h]{\beta^-} ^{242}_{96}Cm$$

A confirmation of the identification of the nuclide $^{241}_{95}Am$ involved the physical separation (based upon volatility) of $^{241}_{95}Am$ from its parent $^{241}_{94}Pu$ in a separated mass 241 sample.

Some comments should be made, at this point, concerning the similarity of these two elements to the rare-earth elements. The hypothesis that elements 95 and 96 should have a stable III oxidation state and greatly resemble the rare-earth elements in their chemical properties proved to be true. In fact, the near identity of their properties greatly hindered the efforts of the discovery team. The better part of a year was spent in trying, without success, to separate chemically the two elements from each other and from the fission product and carrier rare-earth elements. Although the discovery team was confident on the basis of their chemical and radioactive properties and the methods of production, that isotopes of elements 95 and 96 had been produced, the complete chemical proof still was lacking. The elements remained unnamed during this period of futile attempt at separation (although one of the group referred to them as "pandemonium" and "delirium" in recognition of their difficulties). The key to their chemical separation, which occurred later at Berkeley, and the technique which made feasible the separation and identification of subsequent transuranium elements was the ion-exchange technique.

The present names of these new elements were proposed on the basis of their chemical properties. The name "americium" was suggested for element 95, after the Americas, by analogy with the naming of its rare-earth counterpart or homologue,