

and the second, helium ions with 40 Mev of energy:

Following the bombardments, the plutonium oxide was dissolved by the use of sulfuric acid, heating until extensive fumes of sulfur trioxide appeared, and then heating further to dryness. This was followed by the dissolution of the plutonium sulfate in dilute nitric acid and the remaining undissolved oxide was dissolved by heating with nitric acid, together with a small amount of added hydrofluoric acid.

On the assumption that the III oxidation state of element 96 would be present and would have an insoluble fluoride, lanthanum fluoride was precipitated from the solution after oxidizing the plutonium to the soluble VI oxidation state with 0.7 N nitric acid (in some experiments 0.1 N potassium dichromate was used with equally satisfactory results). The precipitate contained the beta-active rare earth fission product elements and presumably also contained any element 96 present in the III oxidation state. The precipitate was dissolved and the operation was repeated until all of the plutonium was eliminated. Although this procedure of necessity led to a concentration of a large amount of beta-activity due to the fission products along with the element 96, it was still possible to examine the alpha-activity which remained in this fraction.

At the beginning of the investigation the alpha-particles were identified as to range by means of absorption in very thin mica sheets placed immediately over the sample in an ordinary parallel plate ionization chamber. Later a multi-channel pulse analyzer was constructed and all subsequent energy measurements were made by employing it. With this instrument a thin sample is placed in an ionization chamber in which the total ionization of an alpha-particle can be measured as a voltage pulse. Individual pulses are sorted electronically and recorded on a number of

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