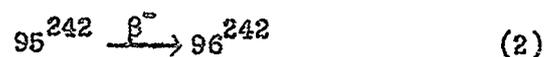
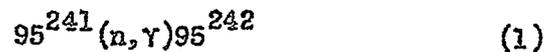


That this has now been confirmed to be the correct isotopic assignment will be made clear from the discussion of the remainder of the results of this investigation.

This same radioactivity was produced later (November and December, 1944) in a series of neutron bombardments of americium in which both bombardment time and total neutron exposure varied widely as a result of the use of the chain reacting piles at both Clinton and Hanford. In all of these neutron irradiations it was found that the ratio of the total intensity of the 4.75 cm alpha particles to that of the 4.05 cm alpha particles of Am^{241} varied approximately as the first power of the total neutron irradiation. The following sequence of nuclear reactions accounts for these observations:



The 4.75 cm alpha particles are due to the isotope 96^{242} . The decay rate here again corresponds to a half-life of five months so that this radioactivity agrees both in half-life and alpha-particle range with the 96^{242} formed from the helium-ion bombardment of Pu^{239} .

The chemical evidence which allowed all previously known elements to be eliminated is as follows:

(1) The activity is carried quantitatively by lanthanum fluoride from solutions previously treated with various reducing and oxidizing agents ranging from zinc amalgam to argentic ion. The carrying is not influenced by the use of ammonium fluoride instead of hydrofluoric acid. This evidence alone eliminates all previously known elements except indium, lanthanum, and all of the rare earths, yttrium, actinium, thorium, and possibly protactinium.

(2) The activity is not precipitated with indium sulfide from acetic acid solution, thus eliminating indium.