

fast mechanical registers in such a way as to separate the individual alpha-particle energies in a mixture of alpha-emitters.

The neutron irradiation of the americium samples was made in the uranium-graphite chain reacting piles at the Clinton Laboratories and the Hanford Engineer Works. The samples irradiated in the Clinton pile were placed in the removable graphite stringer at the approximate center of the pile. In the Hanford pile the samples were inserted in the regular channels with graphite spacers between the sample cans and the uranium slugs.

In the experiments in which the plutonium daughters were chemically separated after their growth as decay products from the isotopes of element 96, essentially the same method of chemical separation of plutonium from element 96 was used. In this case of course it was the oxidized plutonium which was recovered following the successive separation of lanthanum fluoride precipitates which removed the element 96.

2. Results

2.1 The Isotope 96^{242} . The helium-ion bombardment of plutonium led to the first definite identification (in July and August of 1944) of an isotope of element 96. In the first helium-ion bombardment about 10 mg of Pu^{239} was bombarded with helium ions of 32 Mev energy for a total of about 37 microampere-hours in the Berkeley 60-inch cyclotron. After the chemical separations described above, the rare earth fraction was found to contain about 500 disintegrations per minute of an alpha-activity with a range of about 4.75 ± 0.1 cm in air at 15° C and 760 mm of mercury pressure. This activity decayed with a half-life of five months (5.0 ± 0.1 months). The first isotopic assignment of this activity was to the isotope 96^{242} , formed in the reaction $Pu^{239}(\alpha, n)96^{242}$.