(2) Its behavior with various carriers and oxidizing agents which showed it to be similar to cerium with regard to its oxidation potential. The cerium and all rare earth fission products were separated from it by means of the Dowex-50 resin column employing hydrochloric acid as the eluting agent.

(3) Its radioactive properties, particularly the high alpha-particle energies. This may be illustrated by referring to Figs. 6, 7, 8, and 9 of reference 4 which show the alpha-half-life vs. energy relationships of various nuclides as a function of atomic number. That the atomic number is clearly greater than 94 is also proved by measurement of the energy spectrum of the L x-rays in the xenon proportional counter connected to the pulse analyzer. It may be noted there are no known plutonium, americium, or curium isotopes of 4.6-hour half-life.

(4) The identification of curium and americium daughters which are produced by electron capture and alpha-particle decay.

The best evidence in regard to the mass assignment is in the growth of the americium daughter activity of half-life ~15 hours which must have been produced by the alpha-particle decay of the 4.6-hour activity. The small amount of this ~15-hour activity observed made it difficult to determine a precise value of the half-life or to characterize the radiations. However, the only known americium isotope of similar half-life characteristics is the 12-hour electron-capture isotope Am^{239} whose assignment is practically certain.[14] The activities were sufficiently similar and the amount of the 15-hour activity sufficiently near expectations as to make the identification probable. Therefore, the mass number of the 4.6-hour berkelium activity is probably 243.

The growth of the curium isotope which emits alpha-particles of about 5.84-Mev energy also suggests the assignment to mass 243 for the following reasons. Other experiments performed in this laboratory have indicated that Cm^{244} emits alpha-particles of slightly different energy, namely, 5.79 Mev and that its