

Preparation and Bombardment of Targets

The curium targets were prepared for bombardment in the Crocker Laboratory 60-inch cyclotron by the evaporation of solutions containing microgram amounts of curium nitrate in small platinum dishes of about 0.5 cm^2 area followed by ignition to form curium oxide. In some of the experiments Am^{241} was present to facilitate handling of the smaller amounts of curium and to produce Bk^{243} for purposes of comparison. These targets were bombarded in the same target assembly and in the same manner as has been described previously in a paper on berkelium.¹⁰ The energies of the helium ions used in the bombardments were about 35 Mev (actually more nearly 33 Mev). The intensity of the bombardments averaged about 3 microamperes per square centimeter of target area and the time of bombardment was usually 2 to 3 hours. The helium ion beam also contained some deuterons of energies approximately one-half the energy of the helium ions. (The presence of the isotope Bk^{243} observed in the experiments where Am^{241} was absent was due to the reaction $\text{Cm}^{242}(\text{d},\text{n})\text{Bk}^{243}$.)

Chemical Procedure

Following the bombardment, the platinum dish containing the sample was removed to a glovebox¹⁰ and the curium oxide dissolved in 6M HNO_3 with heating (about 75°C). Curium hydroxide was precipitated with added lanthanum carrier by the addition of excess ammonium hydroxide and was separated by centrifugation. The hydroxide precipitate was dissolved in dilute perchloric acid (0.5M) and the mixture of radioactivities was adsorbed on a small amount of ammonium form Dowex-50 resin (spherical fines) which was then transferred to an approximately 17-cm length, 2-mm diameter column packed with the same resin. The column was surrounded by a vapor jacket through which passed trichloroethylene vapor to maintain the temperature at about 87°C . The elution was performed by passing ammonium citrate (buffered with citric acid to pH 3.5--total citrate concentration 0.25M) through the column at a rate