information was obtained concerning the chemical identity, since the isotope Bk^{243} was observed to separate from the 45-minute radioactivity.

The Search for Daughters of the Alpha-Particle Decay

The fractions containing the 45-minute activity resulting from separations on the second resin column were examined for possible daughter radioactivities. In these fractions alpha-radioactivity from Cm^{242} had been reduced to approximately one disintegration per minute. Careful examination of these fractions using the alpha-particle pulse analyzer failed to show any alpha-particle peak other than that of the residual unseparated Cm^{242} after the 45-minute activity had decayed completely. On the assumption that the 45-minute activity is 98^{244}, the amount of its alpha-radioactivity present in the initial fractions should have produced approximately 0.1 disintegration per minute of alpha-radioactivity due to the alpha-decay daughter Cm^{240}. The level of the background radioactivity in the pulse analyzer chamber was too high to show a definite identification of this amount of daughter isotope.

Cross Section for Formation of Element 98 Isotope

The cross section for the production of the 45-minute activity in the bombardment of Cm^{242} with approximately 33-Mev helium ions was calculated as roughly 3×10^{-27} cm^2. In this calculation, decay is assumed to be entirely by the emission of the alpha-particles which were observed. A comparable rate of decay by electron capture is entirely possible and this would of course lead to a proportionately higher cross section. The chemical yield of the 45-minute radioactivity was estimated as approximately 90 percent, based on measured values for separations of the same type. Measured values of the effective weight of target material, the cyclotron beam and time intervals were used in the calculations.