the berkelium had undergone decay so that the daughters were present as the result of essentially complete decay, but there was still enough berkelium present to indicate its position in the column elution sequence. Present also was a trace of Am^{241} to mark the position of americium isotopes. The elutriant fractions from the column showed the presence of the curium isotope with the alpha-particles of 5.84-Mev energy shown in Fig. 7, and a very small amount of an americium isotope of ~15 hours half-life as shown by counting Auger electrons in the windowless proportional counter (previously described).

It was only possible to follow the 15-hour activity through a very small decay factor (~2) so the probable error in half-life determination is about 40 percent. The background resulting from the presence of Am^{241} was approximately one-half the total counting rate. The amount of the 15-hour activity formed was very nearly the amount expected if it is due to electron-capturing Am^{239} produced[14] by the alpha-particle decay branching of Bk^{243} and if it is also assumed that the counting efficiencies in the windowless counter for these two isotopes are the same.

Branching Ratio and the Cross Section for Formation of Bk^{243}

The disintegration rates corresponding to measured fractions of the total berkelium produced in the bombardments were calculated from the L x-ray counting rates as previously described. The corresponding alpha-particle disintegration rates of the 4.6-hour activity allow a direct calculation of the alpha-decay to electron-capture decay ratio. The alpha-branching percentage was found to be ~0.1 percent. The corresponding partial half-life for alpha-particle emission is calculated directly as about 1 year.

The cross section for the production of the 4.6-hour activity in the bombardment of Am^{241} with 35-Mev helium ions is calculated as $\sim 10^{-26}$ cm^2. The corresponding

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[14] Street, Ghiorso, and Seaborg, Phys. Rev. (to be published).