

Here the ordinates are normalized to show equal amounts. These results might also be summarized thus: the difference in rates of elution between berkelium and curium as compared with the difference between curium and americium is remarkably similar to the spacing terbium-gadolinium and gadolinium-europium.

With regard to the group separation of actinides from rare earths using the Dowex-50 resin column with 13M HCl, the new 4.6-hour activity was separated in the fractions containing curium and americium. These fractions were free of rare earth fission products which were removed from the column much more slowly because of the lesser extent of rare earth complexing with hydrochloric acid.

Chemical Results - Tracer Experiments

Using pure solutions of the 4.6-hour activity prepared by the ion exchange separations method a number of separate tracer experiments were performed to extend the knowledge of the chemical properties of the new element. Carriers such as lanthanum fluoride, lanthanum hydroxide, copper sulfide, zirconium phosphate, and ceric iodate were employed under conditions where the behavior of other actinide elements is well known. The oxidation-reduction properties of berkelium were studied with such agents as bromine, chlorine, dichromate ion, bromate ion, cerium (IV) ion, permanganate ion, and sodium bismuthate. In these experiments the distribution of the berkelium into the various fractions was determined by means of a Geiger counter. A complete report of these experiments is to be published elsewhere¹⁵ but the salient results will be summarized here.

It was found that the 4.6-hour activity was not carried by zirconium phosphate unless powerful oxidizing agents such as bromate ion or sodium bismuthate were present; in the presence of these oxidizing agents it was well carried. It was well carried by the carriers lanthanum fluoride or lanthanum hydroxide in solutions ranging from strongly reducing to strongly oxidizing.

¹⁵Thompson, Cunningham, and Seaborg, J. Am. Chem. Soc. (in press), May, 1950.