

The results reported here were obtained in several instances in experiments which were primarily intended to separate and identify isotopes of the new elements rather than to obtain the maximum information concerning chemical properties. Since most of the experiments were essentially independent of each other, a separate introduction and discussion of each experiment is given in the section describing the experiment.

In the experiments to be described, the radioactivity of the isotopes of the new elements was normally measured by alpha particle pulse analysis of thin samples from the separated fractions. The sample deposits were made on platinum plates by the evaporation and ignition of the elutriant solutions from resin column experiments, and were usually essentially weightless. In the case of Bk^{249} , the soft beta particles were counted in a windowless proportional counter (Nucleometer).

Ion Exchange Separations

1. Dowex 50 Resin - Ammonium Citrate Elution at 87° C. Since much of the prior work on separations of the heaviest elements has been done using this method,⁶⁻⁸ it seems worthwhile to show the relative positions of elements 99 and 100 in the citrate elution curves of Fig. 1. In this experiment some of the elements were present in rather low abundance, so that for convenience the heights of the peaks have been adjusted to a constant level without, of course, altering their shapes. The following deviations from the method of references 7 and 8 were employed: (1) The columns were shortened from 20 cm. to about 15 cm. (2) The pH of the ammonium citrate was changed to 3.35 ± 0.05 . These changes affect the