

cross section for the reaction at 30 Mev appears to be lower possibly by as much as a factor of two, although the latter value is less reliable. These calculations are based on the assumptions mentioned previously in regard to counting yields for the L x-rays.

Chemical Results - Ion Exchange Behavior

The behavior of the new 4.6-hour activity in the ion exchange separations used in its separation are highly significant for the assignment of the atomic number 97.

The results of the column separations involving ammonium citrate elution from a Dowex-50 resin column are best shown by the elution curve given in Fig. 8. This curve is a composite taken from several typical experiments. In some of the experiments the rare earth fission products were not removed until after the 4.6-hour activity had been separated from curium and residual americium; in such cases a direct comparison of the elution position of element 97 with the elution positions of some rare earth elements was obtained and these results are included in the composite curve of Fig. 8. The relative positions of the other rare earths were obtained from separate experiments done under as nearly identical conditions as possible. In all cases radioactive isotopes of the elements were present at tracer concentrations without added inactive isotopes. The activities were counted with a Geiger counter except for americium and curium whose alpha-particles were counted. The ordinate is given as counts per minute per drop; in some cases the counting rates are normalized to allow plotting on a scale suitable for comparison.

These results might be summarized thus: element 97 eluted in a position well ahead of curium as would be expected, and it was found between terbium and gadolinium in the rare earths.

A region of particular importance is illustrated in Fig. 9 which compares the elution positions of the group berkelium-curium-americium of the actinides with those of the homologous lanthanide group terbium-gadolinium-europium.