

dissolved in dilute perchloric acid (0.5M) and the mixture of radioactivities was adsorbed on a small amount of ammonium form Dowex-50 resin\* (spherical fines) which was then transferred to a 20 cm length, 2 mm diameter column packed with the same resin (refer to Fig. 3). The column was surrounded by a vapor jacket through which passed trichloroethylene vapor to maintain the temperature at about 87°C. The elution was performed by passing ammonium citrate (buffered with citric acid to pH 3.5 - total citrate concentration 0.25M) through the column at a rate of 1 drop (~0.030 cm<sup>3</sup>) about every two minutes and the drops were collected separately. (The element 97 fractions were usually collected in drops 35-40, and for comparison curium was collected in drops 60-65. The element 97 position is between terbium and gadolinium on these columns.) In order to separate the element 97 which was being sought from residual rare earth fission products, the citrate fractions in which it was present were combined and made acidic by the addition of HCl. The activity was adsorbed on Dowex-50 resin and transferred to a ~7 cm length column packed with Dowex-50 resin (hydrogen form)(refer to Fig. 4). Berkelium was then removed from the column more rapidly than the lanthanide elements by elution with 13M HCl, which forms stronger complex ions with tripositive actinide elements than it does with rare earth elements.<sup>9</sup> In the first successful search for element 97, the column employing hydrochloric acid for elution was used first for separation of the actinide elements as a group from the rare earth elements before using the column in which elution is performed with citrate to separate the individual actinide elements, thus making it possible to look for electron and electromagnetic radiations as well as alpha-radioactivity. In this case the excess hydrochloric acid was removed from the actinide fraction elutriant solution by rapid evaporation of the solution in the presence of an air jet. The berkelium separated in either manner was carrier-free and could be evaporated directly on platinum plates for counting purposes. Ignition of the plates to

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