Lawrence Berkeley National Laboratory

Recent Work

Title

ANION EXCHANGE OF NIOBIUM IN 7.0 MOLAR HYDROCHLORIC ACID

Permalink

<https://escholarship.org/uc/item/7gn5n9dv>

Authors

Huffman, E.H.

Iddings, G.M.

Publication Date

1952-04-23

UNIVERSITY OF CALIFORNIA
Radiation Laboratory
Contract No. W-7405-eng-48

UNCLASSIFIED

ANION EXCHANGE OF NIOBIUM IN 7.0 MOLAR HYDROCHLORIC ACID

E. H. Huffman and G. M. Iddings

April 23, 1952

Berkeley, California

DISCLAIMER

This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor the Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or the Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof or the Regents of the University of California.

ANION EXCHANGE OF NIOBIUM IN 7.0 Molar HYDROCHLORIC ACID

E. H. Huffman and G. M. Iddings
Radiation Laboratory
University of California, Berkeley, California
April 23, 1952

It has recently¹ been reported that the elution of titanium

(1) William E. Brown and William Rieman III, J. Am. Chem. Soc.,
74, 1278 (1952).

from a cation exchange resin with citrate solution has resulted in broad elution bands with several peaks. This behavior was attributed to the probable partial separation of the isotopes of titanium. Work in this laboratory on the elution of niobium with hydrochloric acid from an anion exchange resin, subsequent to that previously reported,²

(2) E. H. Huffman, G. M. Iddings and R. C. Lilly, ibid., 73, 4474 (1951).

has shown a somewhat similar behavior, but under conditions which precluded any possible isotope separation.

When carrier-free Nb⁹⁵ prepared as described before,² was adsorbed from a 10.0 M hydrochloric acid solution on a Dowex 2 anion exchange resin column, 8.0 cm. long and 3.0 mm. in diameter, and then eluted with 7.0 M hydrochloric acid at the rate of about 2.4 ml. per hour, the elution curve shown in Fig. 1 was obtained. The possibility of any foreign activity in the purified Nb⁹⁵ accounting for three peaks was eliminated by obtaining the decay rates of the samples taken at the top of each peak. All three gave identical decay curves, corresponding

to the disintegration rate of Nb⁹⁵. When this experiment was repeated a somewhat different curve was obtained. Again three peaks were found, but these were rounded, and the areas under the first and third were approximately equal and greater than that of the second. Brown and Rieman¹ also report that their elution bands were not exactly reproducible.

This departure from the expected type of elution band can probably be attributed to the slow establishment of equilibrium among various ionic species which are present. These ions would not necessarily have to have different charges, as in the case of the thiocyanate complexes of chromium,³ but may contain different numbers of chloro-, oxy- and

(3) E. L. King and E. B. Dismukes, ibid., 74, 1674 (1952).

hydroxy- groups. Elution with 6.0 M hydrochloric acid gives the usual symmetrical curve.

This work was done under the auspices of the Atomic Energy Commission.

FIG. I

MU3505