

The Isotopic Constitution of Barium and Cerium

In the *Physical Review* for May 15, J. P. Blewett and M. B. Sampson¹ report the observation of an isotope of barium at mass 134 in the ions from the heated oxide, in addition to the four isotopes observed by Aston at 135, 136, 137 and 138. I have photographed several mass spectra of the barium ions formed in a high frequency spark between two barium electrodes, which show two still fainter isotopes at 130 and 132.² A reproduction is given in Fig. 1. The heavier isotopes are much overexposed in order to bring out the two faint ones. With cerium³ two faint isotopes at 136 and 138 have also been observed, in addition to the two strong ones at 140 and 142.² This occurrence of two faint components separated by two mass units at the lower end of the series of isotopes, is a striking feature of several elements in this region, Ce, Ba, Xe, Sn, and Cd. In a plot of the isotopes of the elements with the number of neutrons and protons as coordinates, as in the one given by Elsasser,⁴ the lightest barium isotope

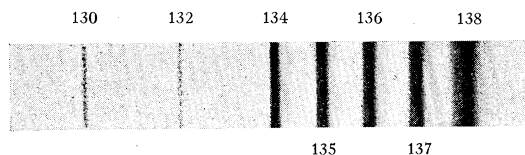


FIG. 1.

at 130 and the lightest cerium isotope at 136 fall on the straight line indicating the lower mass limit for nuclear stability.

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¹ J. P. Blewett and M. B. Sampson, *Phys. Rev.* **49**, 778 (1936).

² These results were presented at the meeting of the American Philosophical Society, April 25, 1936, and are in course of publication in the *Proceedings of the Society*.

³ The author is indebted to Professor B. S. Hopkins for a sample of pure cerium oxide.

⁴ W. M. Elsasser, *Annales de l'Institut Henri Poincaré*, Vol. V (1935), p. 228. See also H. D. Harkins, *Proc. Nat. Acad. Sci.* **19**, 313 (1933).

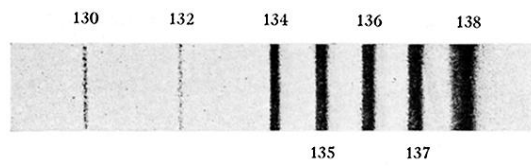


FIG. 1.