

THE NEW ELEMENT BERKELIUM (ATOMIC NUMBER 97)

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ABSTRACT

An isotope of the element with atomic number 97 has been discovered as a product of the helium-ion bombardment of americium. This isotope decays with the emission of alpha-particles of maximum energy 6.72 Mev (30 percent) and it emits lower energy alpha-particles of energies 6.55 Mev (53 percent) and 6.20 Mev (17 percent). The half-life of this isotope is 4.6 hours and it decays primarily by electron capture with about 0.1 percent branching decay by alpha-particle emission. The mass number is probably 243 as indicated by chemical separation of the alpha-particle and electron-capture daughters. The name berkelium, symbol Bk, is proposed for element 97.

The chemical separation of element 97 from the target material and other reaction products was made by combinations of precipitation and ion exchange adsorption methods making use of its anticipated (III) and (IV) oxidation states and its position as a member of the actinide transition series. The distinctive chemical properties made use of in its separation and the equally distinctive decay properties of the particular isotope constitute the principal evidence for the new element.