^{133}Xe

Wu from the University of California at Berkeley reported the identification of ^{133}Xe in the 1940 article "Identification of two radioactive xenons from uranium fission" (1940Wu05). Barium and cesium targets were irradiated with neutrons produced by bombarding beryllium with 16 MeV deuterons forming ^{133}Xe in the reactions ^{136}Ba(n,α) and ^{133}Cs(n,p), respectively. Resulting activities were measured with an ionization chamber following chemical separation. "Cesium has only one stable isotope with a mass number of 133, and since its bombardment gives only one radioactive xenon, we assume that the 5-day xenon is produced by the following reaction $_{55}Cs^{133}(n,p)_{54}Xe^{133}$ and assign to it the mass number 133. Although barium has seven known isotopes (130, 132, 134, 135, 136, 137 and 138), only three of them would be able to produce radioactive xenon (except for isomers of stable nuclei) by a (n,α) reaction. These are 130, 136, and 138. We have seen that Ba gives by a (n,α) reaction the 5-day xenon and we interpret this as $_{56}Ba^{136}(n,\alpha)_{54}Xe^{133}$." Segre and Wu had reported the 5 d half-life in xenon without a mass assignment earlier in the year (1940Se06). Also a 5.5 d half-life had previously been observed in noble gases from neutron fission of thorium (1939La07) and a 4.3 d half-life was assigned to a xenon isotope with mass larger than 131 (1940Do07). In addition, in 1920 Aston had incorrectly reported ^{133}Xe to be a stable isotope (1920As03).

Adapted from reference (2013Ka01)

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