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Newly synthesized an isotope of the 113th element

KOSUKE MORITA, RIKEN (The Institute of Physical and Chemical Research)

The convincing candidate event of the isotope of the 113th element, were observed, for the first time, in the ^{209}Bi + ^{70}Zn reaction at a beam energy of 349.0 MeV with a total dose of 1.7×10^{19}. Alpha decay energies and decay times of the candidates, ^{278}113, ^{274}111, and ^{270}Mt, were (11.68 $\pm$ 0.04 MeV, 0.344 ms), (11.15 $\pm$ 0.07 MeV, 9.26 ms), and (10.03 $\pm$ 0.07 MeV, 7.16 ms), respectively. The production cross section of the isotope was deduced to be 55^{+150}_{-45} fb (10^{-39} cm^2) [1]. The experiment was performed at RIKEN (The Institute of Physical and Chemical Research) Linear Accelerator (RILAC) Facility. The evaporation residues produced by the fusion reaction with a ^{70}Zn beam provided by the RILAC and the bismuth targets, were separated by a gas-filled recoil separator (GARIS) from the beam particles and the target recoils, and were collected at the focus of GARIS. We observed an event of implantation of an evaporation residue in the position-sensitive semiconductor detector followed by four consecutive alpha decays terminated by a spontaneous fission decay. Assignment of the event was based on genetic correlation of sequential alpha decays to the already known nuclides ^{266}Bh and ^{262}Db. The fourth alpha decay and the following spontaneous fission decay were assigned to be the decays of ^{266}Bh and ^{262}Db, respectively because of agreements of decay energies and decay times with the reported values [2]. As a consequence, the preceding three alpha decays were assigned to be ones of ^{278}113, ^{274}111, and ^{270}Mt.

[1] K. Morita, K. Morimoto, D. Kaji, T. Akiyama et al., J. Phys. Soc. Jpn. 73 (2004) 2593.
[2] P. A. Wilk et al., Phys. Rev. Lett. 85 (2000) 2697.