Abstract:

The new element 111 was produced and unambiguously identified in an experiment at SHIP, GSI Darmstadt. In irradiations of 209-Bi targets with 64-Ni projectiles of 318 MeV and 320 MeV three nuclei of the isotope 272-111 were observed. The cross sections are (1.7 +3.3 -1.4) pb and (3.5 +4.6 -2.3) pb, respectively. The nuclei decay by alpha emission into the new and so far heaviest isotopes of the elements 109 and 107 with mass numbers A=268 and A=264. The alpha decay chains were followed down to the known nuclei 260-105 and 256-Lr.