

Detailed study of No and Rf isotopes radioactive decay properties.

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More than 20 years experiments to synthesis and study of super heavy elements radioactive decay property are carried out in the Laboratory of Nuclear Reactions. Basically complete fusion reactions of ^{48}Ca accelerated beam with targets heavier than Uranium are used.

Isotopes of super heavy elements (SHE) are synthesized in the complete fusion reaction of heavy ions with target nuclei followed by neutron evaporation from exciting compound nucleus. Complete fusion reaction with neutron evaporation can be used for synthesis of limited SHE isotopes number. It is premised on presence of limited number of transuranium isotope elements which are used as a target.

The detailed study experiments of Rf and No radioactive decay properties were carried out on cyclotron U400 FLNR JINR 2018-2019 years. ^{256}Rf was studied in the complete fusion reactions $^{50}\text{Ti} + ^{207}\text{Pb} \rightarrow ^{257}\text{Rf}$ and $^{50}\text{Ti} + ^{208}\text{Pb} \rightarrow ^{258}\text{Rf}$. The half-life times by spontaneous fission and alpha-decay were determined and decay modes probabilities were specified ($b_{\alpha} = 0.0029$ $b_{\text{SF}} = 0.9971$) in a good agreement with existing data [1][2].

^{254}No , ^{252}No and ^{250}No isotopes were synthesized in the complete fusion reactions $^{48}\text{Ca} + ^{208}\text{Pb} \rightarrow ^{256}\text{No}$, $^{48}\text{Ca} + ^{206}\text{Pb} \rightarrow ^{254}\text{No}$ and $^{48}\text{Ca} + ^{204}\text{Pb} \rightarrow ^{252}\text{No}^*$ respectively. These isotopes were studied for isomer stations.

1. F.P. Hessberger et. al., // Spontaneous fission and alpha-decay properties of neutron deficient isotopes $^{257-253}\text{104}$ and $^{258}\text{106}$ // Z. Phys. A 359, 415-425 (1997).
2. A.I. Svirikhin, A.V. Yeregin, I.N. Izosimov et. al., // Spontaneous Fission of ^{256}Rf , New Data // Physics of Particles and Nuclei Letters. 2016. V. 13. № 4. P. 480-482.

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