Microsecond Isomers in the Neutron-Rich A~95 region

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Microsecond isomers have recently been measured in ^{95}Kr [1], ^{96}Rb [2] and ^{98}Zr, at the Lohengrin fission-fragment spectrometer of the high-flux reactor of the Institut Laue-Langevin, Grenoble. Ions were detected with a split anode-ionization chamber and gamma-rays measured with a Clover Ge detector and a Miniball triple cluster. Coincidence measurements at the spectrometer focal point of gamma-time and gamma-gamma-time, relative to the arrival of a fission fragment, allowed the isomer states to be identified, assigned to a particular nucleus and level schemes constructed.

The isomeric state in ^{95}Kr is proposed to originate from a neutron $g_{9/2}$ orbit, and these measurements constitute the first observation of any excited states in this very neutron-rich nucleus. It is interesting to note that the structure of this very neutron-rich is similar to other $N = 59$ isotones close to stability.

The low-energy and isomeric states in the very neutron-rich ^{96}Rb appear to be single particle in nature. The isomeric state, at spin 10^- is thought the be a maximally aligned $pg_{9/2}$ $nh_{11/2}$ configuration, which feeds a collective band.

A high-spin isomer in ^{98}Zr, of halflife 1.9 (2) microseconds has been measured. The isomeric state at 6.603 MeV of excitation energy is thought to be spherical with spin (17^-), is unique in the neutron-rich A~100 region for its high excitation energy and spin. It decays via an *E2* transition, into two collective bands. The isomer is proposed to have a $p(g_{9/2}^2)$ $n(g_{7/2}^1 h_{11/2}^1)$ configuration. These isomers demonstrate that single-particle states can compete with collective modes of excitation in this mass region due to the attractive neutron-proton interaction for orbits with similar spins.

[1] J. Genevey, R. Guglielmini, R. Orlandi, J. A. Pinston, A. Scherillo, G. Simpson, I. Tsekhanovich, N. Warr, and J. Jolie, Phys. Rev. C **73**, 037308 (2006).
[2] J. A. Pinston, J. Genevey, R. Orlandi, A. Scherillo, G. S. Simpson, I. Tsekhanovich, W. Urban, H. Faust, and N. Warr, Phys. Rev. C **71**, 064327 (2005) .