

SPECTROSCOPY OF PROTON-RICH N=82 ISOTONES*

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Proton-rich N=82 isotones have been populated in the reaction $^{96}\text{Ru}(^{58}\text{Ni},xp)$ with a beam energy of 250 MeV. Gamma rays were detected with the Gammasphere array at Lawrence Berkeley National Laboratory and charged particles were identified by the Microball detector for channel selection. The strongest reaction channels are the $3p$ channel leading to ^{151}Tm and the $2p$ channel leading to ^{152}Yb .

The main focus of the experiment was to search for shears bands around ^{152}Yb . Analogous to the shears bands in neutron-deficient Pb isotopes, which are built on proton excitations across the Z=82 shell gap coupled to neutron-hole excitations in the $\nu i_{13/2}$ shell, similar excitations can be expected in the very neutron-deficient N=82 isotones around ^{152}Yb . In this case the role of protons and neutrons is exchanged and particle-like excitations across the N=82 shell gap may couple to hole excitations in the $\pi h_{11/2}$ shell.

High-spin states in ^{152}Yb above the $(\pi h_{11/2}^2)10^+$ isomeric state and in other extremely neutron-deficient neighboring nuclides have been observed for the first time in this experiment.

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