Isomer Spectroscopy in the N=Z=41 Nucleus ^{82}Nb

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The self-conjugate N=Z=41 nucleus ^{82}Nb has been studied following the projectile fragmentation of a ^{107}Ag beam at an energy of 750MeV/u on a 4007mg/cm^2 ^{9}Be target. The experiment was part of the Stopped Beam Campaign using the Rare Isotope Investigation (RISING) setup at GSI, and its main goal was the identification of isomeric states of the N=Z odd-odd nuclei in the A~80-90 region and their structural consequences, which will shed light on the competition between T=1 and T=0 pairing correlations [1]. The projectile fragments were separated by the GSI FRagment Separator (FRS) [2] and identified unambiguously by means of their magnetic rigidity, time of flight and energy loss. The ^{82}Nb ions were stopped in a plastic layer of 7mm thickness at the final focal plane of the FRS. The stopper was viewed by a high efficiency, high granularity γ-ray array consisting of 15 EUROBALL cluster detectors. The ground state of ^{82}Nb has been previously reported to be of a T=1, I=0^+ nature [3]. The current work identified a delayed γ-ray transition with an energy of 420 keV associated with the ^{82}Nb residues. The closeness of this energy to the known [4] 407 keV $2^+ \rightarrow 0^+$ transition in the T_z=1 isobar ^{82}Zr, strongly suggests that this transition decays from the 2^+ state of the T=1 multiplet to the ^{82}Nb ground state. The limited statistics did not allow for observation of other excited states in this nucleus and thus the direct decay from the isomer could not be measured. We note that a previous study searching for isomeric decays in ^{82}Nb reported delayed γ-ray events for this nucleus associated with an isomeric decay, but could not identify any discrete lines [5]. Our current data are consistent with this and will provide an isomeric half-life value. The status of the experimental analysis and results will be presented and a discussion of the structure, based on the systematic of T=1 isobars ^{78}Sr [6], ^{82}Zr [4], ^{86}Mo [7], and comparison with shell model calculations will be given.

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