

Adopted Levels

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia		NDS 199,271 (2025)	1-Sep-2024

$Q(\beta^-) = -14900$  syst;  $S(n) = 16010$  syst;  $S(p) = -1110$  syst;  $Q(\alpha) = -2350$  syst [2021Wa16](#)

$\Delta Q(\beta^-) = 640$ ,  $\Delta S(n) = 570$ ,  $\Delta S(p) = 500$ ,  $\Delta Q(\alpha) = 450$  (syst, [2021Wa16](#)).

$S(2n) = 30850$  640,  $S(2p) = 3140$  410,  $Q(\epsilon p) = 7500$  400 (syst, [2021Wa16](#)).

Search for  $^{81}\text{Nb}$  proved negative ([2017Su26](#)).

[2001Ki13](#), [1994He28](#): Production: fragmentation of 112 GeV  $^{112}\text{Sn}$  beam incident on a Be target;  $0^\circ$  magnetic spectrometer for determination of fragment trajectories (FWHM=0.32 for A, 0.23 for Z) prior to implantation into stack of 4 double-sided Si detectors with stacks of seven-fold segmented Si detectors on either side for  $\beta$  detection and surrounded by a segmented NaI detector and a Ge clover detector; measured correlation between implants and daughters,  $T_{1/2}$  ([2000StZU](#), [2001Ki13](#)). Also, a few events ( $\approx 4$  per  $10^{14}$   $^{106}\text{Cd}$  ions), apparently corresponding to  $^{81}\text{Nb}$ , were observed in  $\text{Ni} + ^{106}\text{Cd}$ ,  $E(^{106}\text{Cd}) = 60$  MeV/A using projectile fragment separator (fig. 1(b), [1994He28](#)); however, the attribution of those events to contamination from neighboring peaks in the Z and Q spectra could not be ruled out ([1994He28](#)).

[2017Su26](#):  $^{81}\text{Nb}$  nuclide searched for in  $^9\text{Be}(^{124}\text{Xe}, X)$ ,  $E(^{124}\text{Xe}) = 345$  MeV/nucleon beam produced by the cascade operation of the RIBF accelerator complex of the linear accelerators RILAC and RILAC-II and the four cyclotrons, RRC, fRC, IRC, and SRC. Identification of  $^{81}\text{Nb}$  nuclei was made on the basis of magnetic rigidity, time-of-flight and energy loss (tof- $B\rho$ - $\Delta E$  method) of the fragments using BigRIPS fragment separator, atomic number Z of fragment by tof and  $\Delta E$ , and A/Q (atomic mass/charge state) of fragment by  $B\rho$  and tof. Time-of-flight was measured using thin plastic scintillators,  $\Delta E$  by MUSIC ionization chambers, and  $B\rho$  by particle trajectory reconstructions. Experiments were performed at RIBF-RIKEN facility. Measured A/Q versus Z distributions. No events were observed for  $^{81}\text{Nb}$ , indicating its unbound character towards proton emission. (Edited/Adapted the XUNDL dataset compiled by B. Singh (McMaster), Dec 22, 2017).

 $^{81}\text{Nb}$  Levels

E(level)	$T_{1/2}$	Comments
0.0	<40 ns	$\% \epsilon + \% \beta^+ = ?$ $T_{1/2}$ : from <a href="#">2017Su26</a> , based on the production yield systematics of neighboring isotopes, the TOF, and in-flight decay; the estimated counts of $^{81}\text{Nb}$ was 2080 in the $^{124}\text{Xe} + \text{Be}$ , $E = 345$ MeV/A, reaction and TOF=440 ns, and assumed observation limit of 1 count. Others: <200 ns ( <a href="#">2001Ki13</a> – from parent-daughter time correlation), <80 ns ( <a href="#">1999Ja02</a> – assuming the observation limit of 1 count and expected yield relative to the neighboring isotopes).