

$^9\text{Be}(^{238}\text{U},\text{F}\gamma)$  2011Wa03,2012Ka36

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	S. Kumar(a), J. Chen(b) and F. G. Kondev		NDS 137, 1 (2016)	31-May-2016

**2011Wa03:**  $^{109}\text{Nb}$  was produced in  $\text{Be}(^{238}\text{U},\text{F})$  reactions at  $E=345$  MeV/nucleon at RIKEN. BigRIPS spectrometer was used to separate the recoiling nuclei, which were implanted into an active stopper consisting of 9 DSSDs, and surrounded by four Compton-suppressed Clover-type HpGe detectors and one  $\text{LaBr}_3(\text{Ce})$  detector. Measured: implant- $\gamma(t)$ , implant- $\beta(t)$  and implant- $\beta\gamma(t)$ .

**2012Ka36:**  $^{109}\text{Nb}$  was produced in  $\text{Be}(^{238}\text{U},\text{F})$  reactions at  $E=345$  MeV/nucleon at RIKEN. BigRIPS spectrometer was used to separate the recoiling nuclei, which were implanted into an aluminum stopper and surrounded by three Clover-type HPGe detectors. Measured: implant- $\gamma(t)$ .

 $^{109}\text{Nb}$  Levels

E(level) <sup>†</sup>	$J^\pi$ <sup>‡</sup>	$T_{1/2}$	Comments
0.0	( $5/2^+$ )	108 ms 5	$T_{1/2}$ : From Adopted Levels. 110 ms 6 using ion- $\beta\gamma(t)$ in <a href="#">2015Lo04</a> and 100 ms +9-8 using ion- $\beta(t)$ in <a href="#">2011Ni01</a> .
116.7 4 312.5 4	( $7/2^+$ )	132 ns 18	The number of implanted $^{109}\text{Nb}$ ions in the isomeric state was $1.6 \times 10^6$ ( <a href="#">2012Ka36</a> ) and $2.3 \times 10^5$ ( <a href="#">2011Wa03</a> ). $T_{1/2}$ : unweighted average of 114 ns +8-7, using 117, 213 $\gamma(t)$ in <a href="#">2012Ka36</a> , and 150 ns 30, using 117, 196, 213 $\gamma(t)$ in <a href="#">2011Wa03</a> . configuration: interpreted as an oblate-shape isomer and associated with the $\pi 7/2^+$ [413] Nilsson orbital in <a href="#">2011Wa03</a> .

<sup>†</sup> From a least-squares fit to  $E_\gamma$ .

<sup>‡</sup> From Adopted Levels.

 $\gamma(^{109}\text{Nb})$ 

$E_\gamma$ <sup>†</sup>	$I_\gamma$ <sup>‡</sup>	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Comments
117.0 5	47 23	116.7	( $7/2^+$ )	0.0	( $5/2^+$ )	$I_\gamma$ : From $I_\gamma(117\gamma)/I_\gamma(312\gamma)=76\ 28$ and $I_\gamma(312\gamma)=62\ 20$ ( <a href="#">2011Wa03</a> ). Note that $I_\gamma(117\gamma)/I_\gamma(312\gamma)=126\ 20$ in <a href="#">2012Ka36</a> .
196.2 5	38 14	312.5		116.7	( $7/2^+$ )	$I_\gamma$ : $I_\gamma(196\gamma)/I_\gamma(312\gamma)=61\ 24$ in <a href="#">2011Wa03</a> , but 132 24 in <a href="#">2012Ka36</a> . The authors in <a href="#">2012Ka36</a> stated that the 196.2 $\gamma$ is contaminated in their work by a 197.1 keV $\gamma$ ray, produced in the $^{19}\text{F}(n,n')$ reaction, and that a correction to $I_\gamma(196.2\gamma)$ was applied.
312.2 5	62 20	312.5		0.0	( $5/2^+$ )	

<sup>†</sup> From [2012Ka36](#).

<sup>‡</sup> From [2011Wa03](#).

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## Level Scheme

Intensities: Relative  $I_\gamma$ 

## Legend

- $I_\gamma < 2\% \times I_\gamma^{\max}$
- $I_\gamma < 10\% \times I_\gamma^{\max}$
- $I_\gamma > 10\% \times I_\gamma^{\max}$

