Adopted Levels, Gammas

History

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

Q(β^-)=10.05×10^3 *53*; S(n)=5.15×10^3 *53*; S(p)=12556 *SY*; Q(α)=−8223 *SY* 2012Wa38
ΔS(p)=661, ΔQ(α)=727 (2012Wa38).

^{109}Nb Levels

Cross Reference (XREF) Flags

A ^{109}Zr β^- decay
B ^{9}Be(^{238}U,Fγ)

E(level)†	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0	(5/2$^+$)	108 ms *5*	AB	%β^-=100; %β^-n≤15 (2009Pe06) Others: %β^-n=31 *5* (1996Me09). T$_{1/2}$: weighted average of 110 ms 6 from ion-$\beta\gamma$(t) in 2015Lo04, 100 ms +9-8 from ion-β(t) in 2011Ni01 and 130 ms 21, from 130 ms *5*(syst) *20*(stat) in 2009Pe06 using ion-β(t). Others: 190 ms 30 in 1996Me09. J$^\pi$: from systematics in lighter, odd-A Nb isotopes and the expected configuration. The assignment is tentative. configuration: likely π5/2$^+$[422] orbital, as in the lighter, odd-A Nb isotopes. The assignment is tentative. PES calculations in 20111Wa03 predicted J$^\pi$=3/2$^-$, π3/2$^-$[301] with β_2=0.324, β_4=−0.030 and γ=0^o. Calculations of 1997Mo25 predicted J$^\pi$=5/2$^-$, π5/2$^-$[303] with β_2=0.355, β_4=−0.067 and β_6=0.007.
116.7 *4*	(7/2$^+$)		AB	J$^\pi$: systematics of the lighter, odd-A Nb isotopes indicate that this is most likely the first member of the ground state band. However, the alternative, J$^\pi$=5/2$^-$, π5/2$^-$[303] assignment cannot unambiguously be excluded.
312.5 *4*		132 ns *18*	AB	T$_{1/2}$: unweighted average of 114 ns *+8−7* using 117, 213γ(t) in 2012Ka36 and 150 ns *30* using 117, 196, 213γ(t) in 2011Wa03 in ^{9}Be(^{238}U,Fγ). configuration: interpreted as an oblate-shape isomer and associated with the π7/2[413] orbital in 2011Wa03. The assignment is tentative. π5/2[303] assignment cannot unambiguously be excluded.

† From a least-square fit to Eγ.

γ(^{109}Nb)

E$_i$(level)	J$_i^\pi$	E$_\gamma$†	I$_\gamma$‡	E$_f$	J$_f^\pi$	Comments
116.7	(7/2$^+$)	117.0 *5*	100	0.0	(5/2$^+$)	
312.5		196.2 *5*	61 *23*	116.7	(7/2$^+$)	I$_\gamma$: Others: Iγ(196γ)/Iγ(312γ)=132 *24* in 2012Ka36 in contradiction with 2011Wa03. The authors in 2012Ka36 stated that the 196.2γ is contaminated in their work by a 197.1 keV γ ray, produced in the ^{19}F(n,n′) reaction, and that a correction to Iγ(196.2γ) was applied.
		312.2 *5*	100 *32*	0.0	(5/2$^+$)	I$_\gamma$: see the comment to the 196.2γ.

† From 2012Ka36 in ^{9}Be(^{238}U,Fγ).
‡ From 2011Wa03 in ^{9}Be(^{238}U,Fγ).

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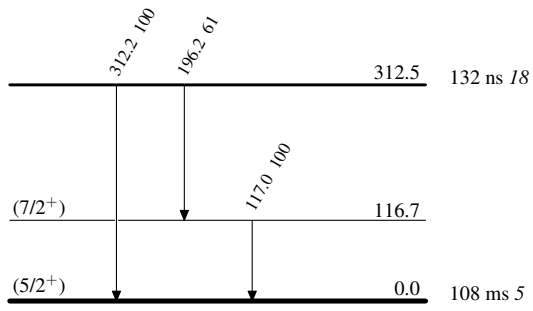
Level Scheme

Intensities: Relative photon branching from each level



$^{109}_{41}Nb_{68}$