^{96}Rb IT decay 2005Pi13,1999Ge01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. Abriola(a), A. A. Sonzogni	NDS 109, 2501 (2008)	1-Apr-2008

Parent: ^{96}Rb: E=1134.6 *11*; $J^{\pi}=(10^-)$; $T_{1/2}$=2.00 μs *10*; %IT decay=100.0

^{96}Rb-$T_{1/2}$: From 2005Pi13. Other: 1.65 μs *15* (1999Ge01).

All information taken from 2005Pi13, unless stated otherwise.

^{96}Rb isotope produced ^{241}Pu(n,f) reaction.

E=thermal. Measured Eγ, Iγ, $\gamma\gamma$, ce-γ coin, lifetimes using two different setups installed at the focal plane of the Lohengrin mass spectrometer that was used to separate fission fragments (FFs). The first consisted of a gas detector to detect FFs, behind which were two adjacent Si(Li) detectors for ce and x-rays, while γ rays were detected by two Ge detectors placed perpendicular to the beam. In the second setup, the FFs were detected in an ionization chamber. γ rays deexciting isomeric states were detected by Clover Ge detector and three single Ge crystals of the Miniball array.

^{96}Rb Levels

Level scheme given in figure 9 of 1999Ge01 is superseded by that in figure 4 of 2005Pi13. Several cascades in 1999Ge01 have been reordered in 2005Pi13.

Low-lying states are expected to result from coupling of $\pi f_{5/2}$ orbital with one of three possible neutron states $\nu s_{1/2}$, $\nu d_{3/2}$, or $\nu g_{7/2}$.

E(level)[†]	J^{π}[@]	$T_{1/2}$	Comments
0.0	$2^{(-)}$		Configuration=$\pi f_{5/2}\nu s_{1/2}$ (1999Ge01).
59.31 *15*	(3^-)		possible member of $\pi f_{5/2}\nu s_{1/2}$ multiplet.
148.87 *25*	(4^-)		Configuration=$[\pi f_{5/2}\nu d_{3/2}]_{4-}$.
185.35 *15*			
187.7 *4*			
225.4 *3*			
461.61[#] *14*	(3^-)		
554.50[‡] *15*	(4^-)		
671.40[#] *18*	(5^-)		
794.82[‡] *22*	(6^-)		
972.5[#] *3*	(7^-)		
1094.6[‡] *3*	(8^-)		
1134.6 *11*	(10^-)	2.00 μs *10*	$T_{1/2}$: From timing of 300 keV transition (2005Pi13). Other: 1.65 μs *15* (1999Ge01). Configuration=$[\pi g_{9/2}\nu h_{11/2}]_{10-}$ (1999Ge01).

[†] From least-squares fit to Eγ's.

[‡] Band(A): π3/2[431]$\otimes\nu$3/2[541], $K^{\pi}=3^-$, α=0. β>0.28, rotational band proposed for this nuclide based upon intense M1 transitions within the group and E2 crossover transitions.

[#] Band(a): π3/2[431]$\otimes\nu$3/2[541], $K^{\pi}=3^-$, α=1. β>0.28, rotational band proposed for this nuclide based upon intense M1 transitions within the group and E2 crossover transitions.

[@] From Adopted Levels.

^{96}Rb IT decay 2005Pi13,1999Ge01 (continued)

$\gamma(^{96}Rb)$

E_γ[†]	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[@]	$I_{(\gamma+ce)}$[#]	Comments
38.0[&a] *5*	7[&] *2*	185.35		148.87	(4$^-$)				E_γ: 37 listed in figure 4 of 2005Pi13.
38.0[&a] *5*	7[&] *2*	187.7		148.87	(4$^-$)				E_γ: 39 listed in figure 4 of 2005Pi13.
40 *1*	3.6 *4*	1134.6	(10$^-$)	1094.6	(8$^-$)	E2	27 *3*	100	E_γ: From text 0f 2005Pi13; not listed in authors′ table I or II. E_γ: Assignment of isomeric transition for this γ ray supported by E2 character and its transition intensity. $I_{(\gamma+ce)}$: Ice(K)=68 *7*; Ice(L)=27 *5*; Ice(M+) assumed (by the evaluators) as 9 *2* from 0.33(Ice(L)). Summed intensity=104 *9*, consistent with 100. Mult.: From comparison of conversion electron intensity ratios with that predicted by theory (K/L=2.9 for E2).
59.3 *2*	17 *2*	59.31	(3$^-$)	0.0	2$^{(-)}$	M1	0.628 *11*		α(K)exp=0.62 *9* α(K)=0.553 *10*; α(L)=0.0633 *11*; α(M)=0.01048 *18*; α(N)=0.001179 *21*; α(O)=4.95×10^{-5} *9* α(N+..)=0.001229 *21* Ice(K)=10.5 *15*.
89.5 *2*	8 *1*	148.87	(4$^-$)	59.31	(3$^-$)	M1+E2	0.8 *7*		α(K)exp=0.59 *15* α(K)=0.7 *6*; α(L)=0.11 *9*; α(M)=0.018 *15*; α(N)=0.0019 *16*; α(O)=5.E−5 *4*; α(N+..)=0.0019 *16* Ice(K)=4.7 *10*.
92.8 *2*	37 *2*	554.50	(4$^-$)	461.61	(3$^-$)	M1	0.178		α(K)exp=0.23 *5* α(K)=0.1569 *24*; α(L)=0.0178 *3*; α(M)=0.00294 *5*; α(N)=0.000332 *5*; α(O)=1.403×10^{-5} *22* α(N+..)=0.000346 *6* Ice(K)=8.5 *20*.
116.8 *2*	36 *3*	671.40	(5$^-$)	554.50	(4$^-$)	M1	0.0946		α(K)exp=0.09 *2* α(K)=0.0834 *13*; α(L)=0.00940 *14*; α(M)=0.001555 *23*; α(N)=0.000176 *3*; α(O)=7.45×10^{-6} *11* α(N+..)=0.000183 *3* Ice(K)=3.0 *9*.
122.0 *3*	32 *3*	1094.6	(8$^-$)	972.5	(7$^-$)				α(K)ex =0.05 *2* for 122.0γ+123.5γ doublet. Ice(K)(122+124)=3.5 *10*.
123.5 *3*	36 *3*	794.82	(6$^-$)	671.40	(5$^-$)				Ice(K)=3.5 *10* for 123.5+122.0. α(K)ex =0.05 *2* for 122.0γ+123.5γ doublet.
126.0 *3*	7 *2*	185.35		59.31	(3$^-$)				
148.8 *3*	7 *1*	148.87	(4$^-$)	0.0	2$^{(-)}$	(E2)	0.225		α(K)=0.194 *3*; α(L)=0.0260 *5*; α(M)=0.00429 *7*; α(N)=0.000456 *8*; α(O)=1.522×10^{-5} *24* α(N+..)=0.000471 *8* Mult.: from weak ce(K) (≈7% intensity from γ(ce) coin).

Continued on next page (footnotes at end of table)

^{96}Rb IT decay 2005Pi13,1999Ge01 (continued)

$\gamma(^{96}Rb)$ (continued)

E_γ[†]	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[@]	Comments
166.1 *3*	7 *1*	225.4		59.31	(3^-)			
177.6 *2*	12 *1*	972.5	(7^-)	794.82	(6^-)			
185.4 *2*	12 *2*	185.35		0.0	$2^{(-)}$			
209.9 *2*	16 *2*	671.40	(5^-)	461.61	(3^-)			
240.3 *2*	42 *3*	794.82	(6^-)	554.50	(4^-)	E2	0.0395	α(K)exp=0.040 *12* α(K)=0.0345 *5*; α(L)=0.00418 *6*; α(M)=0.000688 *10*; α(N)=7.52×10^{-5} *11*; α(O)=2.82×10^{-6} *4* α(N+..)=7.81×10^{-5} *12* Ice(K)=1.7 *5*.
276.3 *3*	5 *1*	461.61	(3^-)	185.35				
300.0 *3*	68 *5*	1094.6	(8^-)	794.82	(6^-)			α(K)exp=0.018 *8* α(K)exp for 300.0+301.0. Ice(K)(300+301)=1.2 *5*.
301.0 *4*	17 *3*	972.5	(7^-)	671.40	(5^-)			α(K)exp=0.018 *8* α(K)exp for 300.0+301.0. Ice(K)(300+301)=1.2 *5*.
329.0 *4*	7 *1*	554.50	(4^-)	225.4				
366.8 *3*	10 *1*	554.50	(4^-)	187.7				
369.2 *3*	13 *2*	554.50	(4^-)	185.35				
402.4 *4*	3 *1*	461.61	(3^-)	59.31	(3^-)			
405.5 *4*	4 *1*	554.50	(4^-)	148.87	(4^-)			
461.6 *2*	48 *3*	461.61	(3^-)	0.0	$2^{(-)}$			
495.2 *3*	5 *2*	554.50	(4^-)	59.31	(3^-)			
554.5 *3*	5 *1*	554.50	(4^-)	0.0	$2^{(-)}$			

[†] From table I of 2005Pi13, unless otherwise stated.
[‡] From comparison of measured α(K)exp′s with theory.
[#] Absolute intensity per 100 decays.
[@] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[&] Multiply placed with undivided intensity.
[a] Placement of transition in the level scheme is uncertain.

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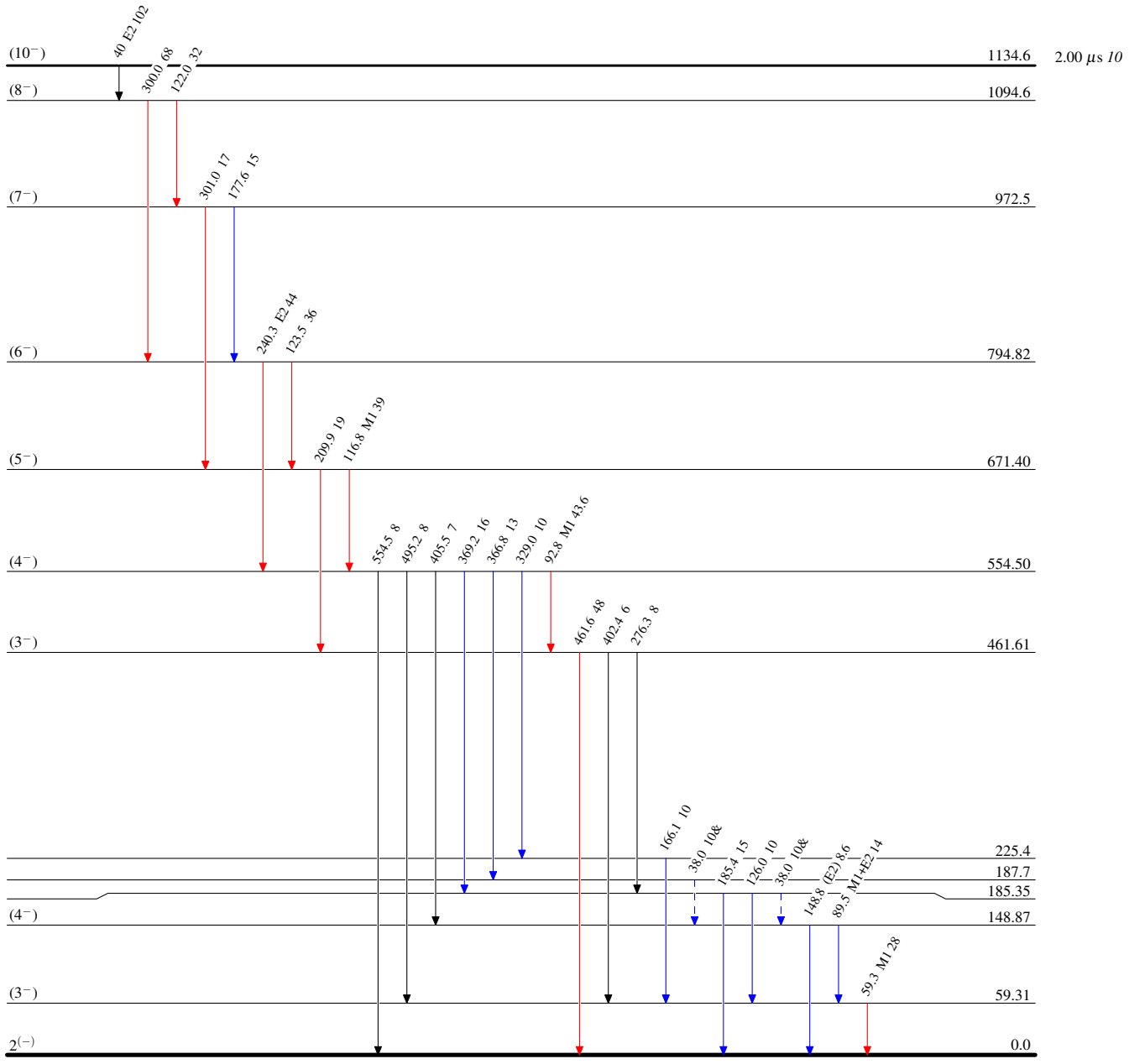
Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given
%IT=100.0

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



$^{96}_{37}Rb_{59}$

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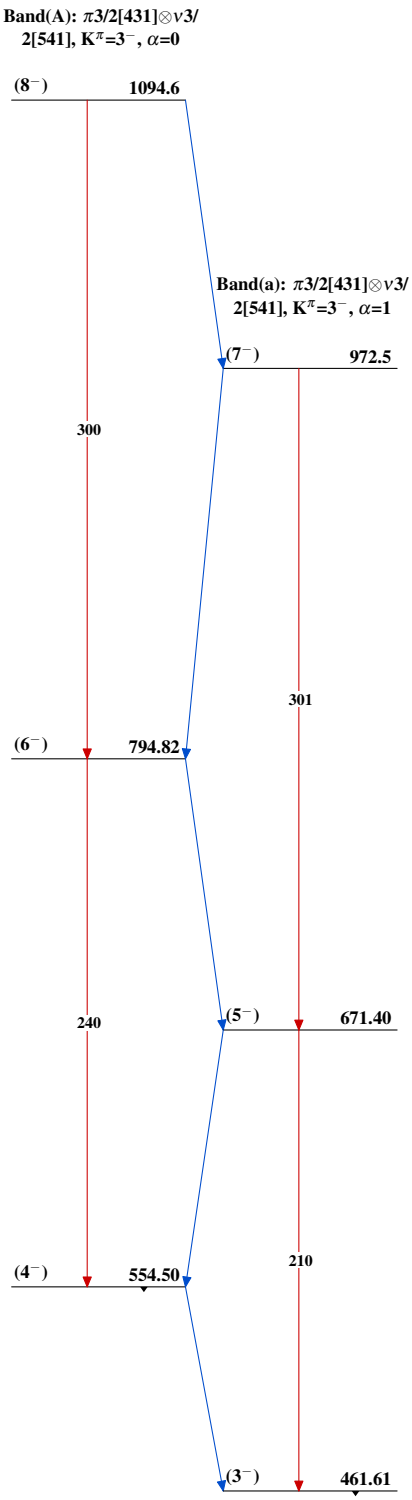

$^{96}_{37}Rb_{59}$