

$^{84}\text{Nb}$  IT decay **2000Ch07**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	D. Abriola and M. Galan		NDS 110,2815 (2009)	30-Sep-2009

Parent:  $^{84}\text{Nb}$ : E=338.7 11;  $J^\pi=(5^-)$ ;  $T_{1/2}=103$  ns 19; %IT decay=100.0

**2000Ch07** (also **1997Re12**): Fragmentation of  $^{92}\text{Mo}$  beam at E=60 MeV/nucleon. Particle identification through LISE3 magnetic spectrometer at GANIL facility. Search for isomers by measuring delayed  $\gamma$  rays using four leps detectors. No coincidence data are available due to low statistics.

Other:

**2007Re18**: Fragmentation of  $^{107}\text{Ag}$  beam at E=750 MeV. Particle identification through fragment recoil separator. Search for isomers using the RISING (Rare ISotope INvestigations at GSI) array of 15 seven-element cluster Ge detectors. The detectors were placed in three angular rings at  $51^\circ$ ,  $90^\circ$ , and  $129^\circ$  with respect to the secondary beam axis. Measured delayed  $\gamma$ -rays of 48, 65, 115, 141, 175 and 205 keV, thus confirming the existence of an isomer in  $^{84}\text{Nb}$ .

Level scheme is as shown by **2000Ch07** based on work of **1999Ma23**.

 $^{84}\text{Nb}$  Levels

E(level) <sup>†</sup>	$J^\pi$ <sup>‡</sup>	$T_{1/2}$	Comments
0	(1 <sup>+</sup> ,2 <sup>+</sup> ,3 <sup>+</sup> )		
47.8 9	(3 <sup>-</sup> ,4 <sup>-</sup> )		
64.7 8	(2 <sup>+</sup> ,3 <sup>+</sup> )		
162.9 11	(4 <sup>+</sup> ,5 <sup>+</sup> )		
205.8 8	(3 <sup>-</sup> )		
338.7 11	(5 <sup>-</sup> )	103 ns 19	%IT=100 $T_{1/2}$ : from <b>2000Ch07</b> .

<sup>†</sup> From Adopted Levels.

<sup>‡</sup> From Adopted Levels.

 $\gamma(^{84}\text{Nb})$ 

$E_\gamma$ <sup>†</sup>	$I_\gamma$ <sup>†@</sup>	$E_i$ (level)	$J^\pi_i$	$E_f$	$J^\pi_f$	Mult. <sup>‡</sup>	$\alpha$ <sup>&amp;</sup>	$I_{(\gamma+ce)}$ <sup>#@</sup>	Comments
47.4	$1.6 \times 10^3$ 3	47.8	(3 <sup>-</sup> ,4 <sup>-</sup> )	0	(1 <sup>+</sup> ,2 <sup>+</sup> ,3 <sup>+</sup> )	(E1)	1.031 16	$3.2 \times 10^3$ 6	
65.0	$1.2 \times 10^2$ 9	64.7	(2 <sup>+</sup> ,3 <sup>+</sup> )	0	(1 <sup>+</sup> ,2 <sup>+</sup> ,3 <sup>+</sup> )	(M1)	0.76 4	$2.1 \times 10^2$ 16	
114.7	100 15	162.9	(4 <sup>+</sup> ,5 <sup>+</sup> )	47.8	(3 <sup>-</sup> ,4 <sup>-</sup> )	(E1)	0.0803 12	108 16	
133.3	76 9	338.7	(5 <sup>-</sup> )	205.8	(3 <sup>-</sup> )	(E2)	0.408 6	107 13	
141.4	57 9	205.8	(3 <sup>-</sup> )	64.7	(2 <sup>+</sup> ,3 <sup>+</sup> )	(E1)	0.0436 7	59 9	
163 <sup>a</sup>	12 3	162.9	(4 <sup>+</sup> ,5 <sup>+</sup> )	0	(1 <sup>+</sup> ,2 <sup>+</sup> ,3 <sup>+</sup> )			12 3	$E_\gamma$ : tentative $\gamma$ proposed by <b>2000Ch07</b> , $I_\gamma$ by evaluators.
175.4	46 7	338.7	(5 <sup>-</sup> )	162.9	(4 <sup>+</sup> ,5 <sup>+</sup> )	(E1)	0.0234 4	47 7	
205.9	49 10	205.8	(3 <sup>-</sup> )	0	(1 <sup>+</sup> ,2 <sup>+</sup> ,3 <sup>+</sup> )	(E1)	0.01477 21	50 10	

<sup>†</sup> From **2000Ch07**.

<sup>‡</sup> From intensity balance considerations in **2000Ch07**.

<sup>#</sup> Calculated by evaluators, corrected for internal conversion based on assumed multipolarity.

<sup>@</sup> For absolute intensity per 100 decays, multiply by 0.65 6.

<sup>&</sup> Total theoretical internal conversion coefficients, calculated using the BrIcc code (**2008Ki07**) with Frozen orbital approximation based on  $\gamma$ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

<sup>a</sup> Placement of transition in the level scheme is uncertain.

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Decay Scheme

Intensities:  $I_{(\gamma+ce)}$  per 100 parent decays  
%IT=100.0

Legend

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

