^{156}Nd β^- decay 2007Sh05,1989OkZX

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich	NDS 113, 2537 (2012)	1-Mar-2012

Parent: ^{156}Nd: E=0; $J^\pi=0^+$; $T_{1/2}$=5.26 s *20*; Q(β^-)=3.69×10^3 *20*; %β^- decay=100.0

^{156}Nd-$T_{1/2}$: From ^{156}Nd Adopted Levels.

^{156}Nd-Q(β^-): From 2011AuZZ.

Additional information 1.

Unless otherwise noted, all the data are from 2007Sh05.

2007Sh05: ^{156}Nd produced by thermal-neutron induced fission of ^{235}U, followed by on-line isotope separation. γ's detected using a HPGe detector and a short coaxial detector. Conversion electrons detected using a cooled Si(Li) detector. Measured Eγ, Iγ, $\beta\gamma$ coin, β(ce) coin, $\gamma\gamma$ coin and (ce)γ coin. Report three excited states in addition to an isomeric state in ^{156}Pm and $T_{1/2}$ values for the g.s. and the isomer.

2004SuZY: same authors as 2007Sh05. Contains information regarding the isomer at 150.3 keV, which subsequently appeared in 2007Sh05.

1987Gr12: ^{156}Nd produced by spontaneous fission of ^{252}Cf, followed by isotope separation. γ's measured with Ge detectors. Two γ's (84 and 150) reported, but with no Iγ values.

1989OkZX: Summary in a laboratory progress report. Thermal-neutron induced fission of ^{235}U, followed by isotope separation.

^{156}Pm Levels

E(level)	J^π	$T_{1/2}$	Comments
0	$4^{(+)}$	26.70 s *10*	J^π: 2007Sh05 propose $J^\pi=(4^-)$, but the evaluator has not adopted this value. See the relevant discussion in the adopted values. $T_{1/2}$: From ^{156}Pm adopted values and based on data of 1987Gr12. Probable conf is π5/2[532]+ν3/2[521]. Note that 2007Sh05 propose that the conf is π5/2[532]+ν3/2[651], in which case π would be negative. The evaluator has not adopted this proposal. See the discussion on this point in the adopted values.
150.3 *1*	$1^{(+)}$	<5 s	%IT≈98; %β^-≈2 J^π: 2007Sh05 propose $J^\pi=(1^-)$, but the evaluator has not adopted this value. See the relevant discussion in the adopted values. $T_{1/2}$: From 2007Sh05. From a careful analysis of the decay curve of the K-line of the 150.3γ, 2007Sh05 suggest the possible presence of a second activity, in addition to that of the g.s., with $T_{1/2}$=2.3 s *20*. They assign it to the decay of an isomeric state at 150 keV in ^{156}Pm. Probable conf is π5/2[532]-ν3/2[521]. 2007Sh05 propose that the conf is π5/2[532]-ν3/2[651], in which case π would be negative. The evaluator has not adopted this proposal. See the discussion on this point in the adopted values.
168.7 *1*			
358.4 *2*			

$\gamma(^{156}Pm)$

E_γ	I_γ[‡#]	E_i(level)
[x]49.2 *2*	8.8 *11*	
[x]60.1[†] *2*	34 *2*	
[x]69.7 *2*	33 *19*	
[x]73.5 *2*	34 *3*	
[x]83.6 *2*	13 *2*	
[x]84.7[†] *1*	100 *3*	
[x]88.6 *2*	38 *3*	
[x]105.3 *1*	25 *3*	
[x]108.7 *1*	3.1 *13*	
[x]112.1 *2*	67 *7*	
[x]126.5 *2*	18 *3*	

Continued on next page (footnotes at end of table)

^{156}Nd β^- decay 2007Sh05,1989OkZX (continued)

$\gamma(^{156}Pm)$ (continued)

E_γ	I_γ[‡][#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[@]	Comments
[x]129.8 *1*	6.4 *13*							
[x]142.4 *2*	3.8 *12*							
[x]144.2 *1*	20 *2*							
150.3[†] *1*	91 *5*	150.3	$1^{(+)}$	0	$4^{(+)}$	M3	20.5	α(K)exp=14 *4*; α(L)exp=4.5 *15* α(K)=13.63 *20*; α(L)=5.29 *8*; α(M)=1.255 *18*; α(N+..)=0.324 *5* α(N)=0.283 *4*; α(O)=0.0397 *6*; α(P)=0.001719 *25*
[x]151.8 *3*	<11							I_γ: γ mixed with a γ from the ^{156}Pm decay.
[x]157.2[†] *1*	116 *4*							
[x]160.9[†] *1*	51.6 *16*							
[x]162.8 *1*	25.8 *15*							
168.7 *1*	23 *3*	168.7		0	$4^{(+)}$			
[x]178.3 *1*	11 *2*							
189.6 *1*	25 *3*	358.4		168.7				
[x]195.5 *2*	7 *2*							
[x]196.5[†] *2*	39 *2*							
[x]198.5 *1*	38 *2*							
[x]238.4 *2*	7 *2*							
[x]269.9 *1*	13.0 *14*							
[x]273.9[†] *1*	47.0 *17*							
[x]319.1[†] *1*	37 *3*							I_γ: γ peak contains a contribution from the 320.2γ from the ^{156}Pm decay.
[x]323.4 *3*	5.7 *13*							

[†] γ also reported by 1989OkZX.
[‡] Where 1989OkZX report the same γ's as 2007Sh05, the Iγ values are generally quite different.
[#] I(Kα x ray)=1100 *160*, I(Kβ x ray)=270 *40*, relative to I_γ=100 for the 150.3γ (1989OkZX).
[@] 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.
[x] γ ray not placed in level scheme.

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Decay Scheme

Intensities: Relative I_γ