

¹⁵⁴Pr β⁻ decay 1996To05,1988Ka16

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 200,2 (2025)	22-Aug-2022

Parent: ¹⁵⁴Pr: E=0.0; J^π=(3⁺); T_{1/2}=2.3 s 1; Q(β⁻)=7.72×10³ 10; %β⁻ decay=100

¹⁵⁴Pr-Q(β⁻): From 2021Wa16.

¹⁵⁴Pr produced by isotope separation of products from neutron-induced fission of ²³⁵U. The authors of 1988Ka16 are coauthors of 1996To05.

Since the Q value is over 7 MeV and only a few levels are reported, this scheme is very incomplete and, therefore, no I(β⁻) values are given. Limits for such values are given by 1996To05.

¹⁵⁴Nd Levels

E(level) ^{†‡}	J ^π #	T _{1/2} @
0.0	0 ⁺	25.9 s 2
70.80 10	2 ⁺	7.7 ns 20
233.21 14	4 ⁺	
961.6 5	(1 ⁻)	
1003.2 4	(2 ⁻)	
1027.64 26	(3 ⁻)	
1128.3 4	(4 ⁻)	
1524.0 5		
1584.2 8		
2194.4 10		

[†] Additional information 1.

[‡] From least-squares fit to γ energies.

From assignments in the Adopted Levels.

@ Adopted values.

γ(¹⁵⁴Nd)

I_γ normalization: Computed to give 100% feeding of the ground state, assuming there is no direct β⁻ feeding of the ground state and only the 70- and 961-keV γ's feed the ground state. The assumption that the ground-state β⁻ branch is negligible is supported by the proposed J^π value of (3⁺) for the ¹⁵⁴Pr g.s.

E _γ [†]	I _γ ^{‡a}	E _i (level)	J _i ^π	E _f	J _f ^π	Mult.	α&	Comments
70.8 1	72 3	70.80	2 ⁺	0.0	0 ⁺	[E2]	7.79	α(K)=2.96 5; α(L)=3.76 6; α(M)=0.861 14 α(N)=0.186 3; α(O)=0.0235 4; α(P)=0.0001258 18 %I _γ ≈11
162.4 1	100	233.21	4 ⁺	70.80	2 ⁺	[E2]	0.398	α(K)=0.279 4; α(L)=0.0931 14; α(M)=0.0209 3 α(N)=0.00454 7; α(O)=0.000607 9; α(P)=1.353×10 ⁻⁵ 19 %I _γ ≈16
520.7 4	12.0 8	1524.0		1003.2	(2 ⁻)			%I _γ ≈1.9
562.5 4	33.2 14	1524.0		961.6	(1 ⁻)			%I _γ ≈5.2
581.0 7	22.2 12	1584.2		1003.2	(2 ⁻)			%I _γ ≈3.5
670.4@ 9	13 4	2194.4		1524.0				%I _γ ≈2.0
794.3 4	16.5 12	1027.64	(3 ⁻)	233.21	4 ⁺			%I _γ ≈2.6
891.2@ 10	21 4	961.6	(1 ⁻)	70.80	2 ⁺			%I _γ ≈3.3
895.1 4	15 5	1128.3	(4 ⁻)	233.21	4 ⁺			%I _γ ≈2.3
932.3 4	76.9 18	1003.2	(2 ⁻)	70.80	2 ⁺			I _γ : From 1996To05; other: 2.0 4 (1988Ka16). %I _γ ≈12

Continued on next page (footnotes at end of table)

^{154}Pr β^- decay **1996To05,1988Ka16** (continued) $\gamma(^{154}\text{Nd})$ (continued)

E_γ [†]	I_γ ^{‡a}	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
956.9 3	15 5	1027.64	(3 ⁻)	70.80	2 ⁺	%I γ ≈2.3 I γ : From 1996To05 ; other: 44.7 18 (1988Ka16).
961.8 [@] 10	10 3	961.6	(1 ⁻)	0.0	0 ⁺	%I γ ≈1.6
^x 1184.4 [#] 4	7.6 10					%I γ ≈1.2

[†] From average of values of **1988Ka16** and **1996To05**.

[‡] From weighted average of values of **1988Ka16** and **1996To05**, except where a large discrepancy is noted. Since the uncertainties in the later paper are significantly larger than those in earlier paper, the values adopted here are very similar to those in **1988Ka16**.

[#] γ reported only by **1988Ka16**.

[@] γ reported only by **1996To05**.

[&] **Additional information 2**.

^a For absolute intensity per 100 decays, multiply by ≈0.156.

^x γ ray not placed in level scheme.

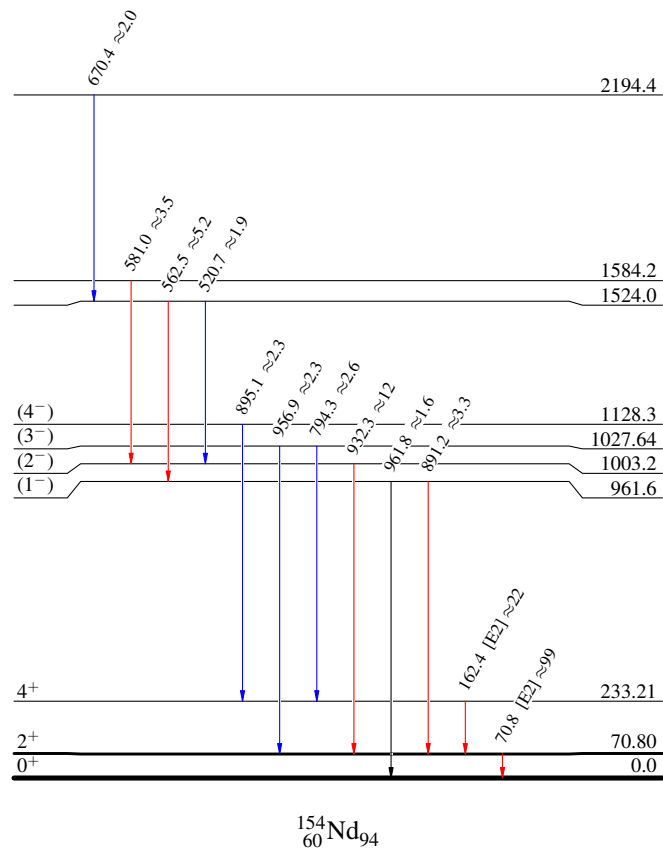
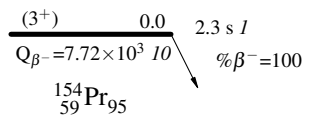
^{154}Pr β^- decay 1996To05,1988Ka16

Decay Scheme

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

Legend

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



7.7 ns 20
25.9 s 2