^{132}Nd ε decay (94 s) 1995Bu11

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov, A. A. Rodionov and S. Sakharov, Balraj Singh	NDS 104, 497 (2005)	10-Feb-2005

Parent: ^{132}Nd: E=0.0; J$^{\pi}$=0^{+}; T$_{1/2}$=94 s *8*; Q(ε)=3790 *60*; %ε+%β^{+} decay=100.0
1995Bu11 (also 1994Bu18): measured Eγ, Iγ, $\gamma\gamma$(t), Xγ(t), ce, ceγ(t), T$_{1/2}$(^{132}Nd isotope).
Others: 1977Bo02 (measured T$_{1/2}$ of ^{132}Nd g.s.).

^{132}Pr Levels

E(level)	J$^{\pi}$†	Comments
0.0	(2)$^{+}$	E(level): probably the g.s. of ^{132}Pr, however the relative spacing between this state and a possible (5^{+}) isomer is unknown.
147.72 *11*	1^{+}	
284.53 *13*	(1,2)$^{-}$	
288.16 *12*	(0 to 3)$^{+}$	J$^{\pi}$: 1^{+} (1995Bu11).
342.90 *13*	(0 to 3)$^{+}$	J$^{\pi}$: 1^{+} (1995Bu11).
387.20 *18*	(0 to 3)$^{+}$	J$^{\pi}$: 1^{+} (1995Bu11).
405.82 *16*	(0 to 3^{+})	
501.34 *16*	(0 to 3)$^{+}$	J$^{\pi}$: 1^{+} (1995Bu11).
526.15 *17*	(0 to 3)$^{+}$	
567.49 *20*	(0 to 3^{+})	
587.44 *24*	(0 to 3)$^{+}$	J$^{\pi}$: (1^{+}) (1995Bu11).
630.42 *24*	(0 to 3^{+})	
714.94 *15*	1^{+}	
724.83 *16*	($\leq$3)	
854.9 *3*	(0 to 3^{+})	
861.23 *22*	(0 to 4^{-})	
981.85 *17*	(0^{+} to 3^{+})	
1330.1 *3*	(0 to 3^{+})	
1440.7 *6*	(0 to 3^{+})	

† From Adopted Levels. Possible allowed ε+β^{+} feedings from 0^{+} suggest 1^{+} for most levels. However, log *ft* values are not considered (by the evaluators) as definitive when feedings are low (<10%).

ε,β^{+} radiations

E(decay)	E(level)	Iβ^{+} †	Iε†	Log *ft*	I(ε+β^{+})†	Comments
(2.35×10^{3}‡ *6*)	1440.7	<0.2	<1.1	>5.4	<1.3	av Eβ=599 *27*; εK=0.733 *15*; εL=0.1034 *22*; εM+=0.0293 *7*
(2.46×10^{3} *6*)	1330.1	0.77 *11*	3.8 *3*	4.9	4.6 *4*	av Eβ=648 *27*; εK=0.705 *17*; εL=0.0993 *24*; εM+=0.0282 *7*
(2.81×10^{3} *6*)	981.85	2.2 *2*	5.4 *5*	4.9	7.6 *6*	av Eβ=804 *27*; εK=0.603 *19*; εL=0.085 *3*; εM+=0.0240 *8*
(2.93×10^{3} *6*)	861.23	0.53 *8*	1.1 *1*	5.7	1.6 *2*	av Eβ=859 *28*; εK=0.566 *19*; εL=0.079 *3*; εM+=0.0225 *8*
(2.94×10^{3} *6*)	854.9	0.3	0.5 *1*	6.0	0.8 *1*	av Eβ=861 *28*; εK=0.564 *19*; εL=0.079 *3*; εM+=0.0224 *8*
(3.07×10^{3} *6*)	724.83	1.6 *3*	2.6 *5*	5.3	4.2 *8*	av Eβ=920 *28*; εK=0.524 *19*; εL=0.073 *3*; εM+=0.0208 *8*
(3.08×10^{3} *6*)	714.94	8.9 *6*	14 *1*	4.6	23 *1*	av Eβ=925 *28*; εK=0.521 *19*; εL=0.073 *3*; εM+=0.0207 *8*
(3.16×10^{3} *6*)	630.42	0.66 *21*	0.9 *3*	5.8	1.6 *5*	av Eβ=963 *28*; εK=0.496 *18*; εL=0.069 *3*; εM+=0.0197 *8*

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^{132}Nd ε decay (94 s) 1995Bu11 (continued)

ε,β$^+$ radiations (continued)

E(decay)	E(level)	Iβ$^+$ †	Iε†	Log *ft*	I(ε+β$^+$)†	Comments
(3.20×10^3 *6*)	587.44	0.47 *13*	0.63 *17*	6.0	1.1 *3*	av Eβ=983 *28*; εK=0.483 *18*; εL=0.068 *3*; εM+=0.0191 *8*
(3.22×10^3 *6*)	567.49	0.4 *1*	0.5 *1*	6.1	0.9 *2*	av Eβ=992 *28*; εK=0.477 *18*; εL=0.067 *3*; εM+=0.0189 *8*
(3.26×10^3 *6*)	526.15	1.5 *1*	1.8 *1*	5.5	3.3 *2*	av Eβ=1011 *28*; εK=0.465 *18*; εL=0.0651 *25*; εM+=0.0184 *7*
(3.29×10^3 *6*)	501.34	2.8 *2*	3.3 *3*	5.3	6.1 *4*	av Eβ=1022 *28*; εK=0.458 *18*; εL=0.0640 *25*; εM+=0.0181 *7*
(3.40×10^3 *6*)	387.20	2.2 *3*	2.3 *3*	5.5	4.5 *5*	av Eβ=1074 *28*; εK=0.426 *17*; εL=0.0595 *24*; εM+=0.0169 *7*
(3.45×10^3 *6*)	342.90	2.6 *5*	2.5 *5*	5.4	5.1 *9*	av Eβ=1094 *28*; εK=0.414 *17*; εL=0.0579 *23*; εM+=0.0164 *7*
(3.50×10^3 *6*)	288.16	1.1 *6*	0.9 *6*	5.9	2.0 *12*	av Eβ=1119 *28*; εK=0.400 *16*; εL=0.0558 *23*; εM+=0.0158 *7*
(3.51×10^3‡ *6*)	284.53	<0.85	<0.75	>6.0	<1.6	av Eβ=1121 *28*; εK=0.399 *16*; εL=0.0557 *23*; εM+=0.0158 *7*
(3.64×10^3 *6*)	147.72	19 *1*	14 *1*	4.7	33 *2*	av Eβ=1184 *28*; εK=0.365 *15*; εL=0.0509 *21*; εM+=0.0144 *6*

† Absolute intensity per 100 decays.
‡ Existence of this branch is questionable.

γ(^{132}Pr)

Iγ normalization: ΣI(γ+ce) of γ′s to g.s.=100; assuming no ε+β$^+$ feeding to ^{132}Pr g.s.

E$_γ$	I$_γ$‡	E$_i$(level)	J^π_i	E$_f$	J^π_f	Mult.	α#	Comments
96.0 *3*	†	501.34	(0 to 3)$^+$	405.82	(0 to 3$^+$)			
99.1 *2*	1.6 *2*	387.20	(0 to 3)$^+$	288.16	(0 to 3)$^+$	M1	1.35	α(K)=1.15; α(L)=0.158; α(M)=0.0332; α(N+..)=0.0091 α(K)exp=1.26 *12* α(L)exp≤0.15.
102.4 *3*	0.8 *2*	387.20	(0 to 3)$^+$	284.53	(1,2)$^-$	[E1]	0.237	α(K)=0.201; α(L)=0.0283; α(M)=0.00588; α(N+..)=0.00153
117.9 *2*	1.2 *5*	405.82	(0 to 3$^+$)	288.16	(0 to 3)$^+$			
121.0 *5*	†	526.15	(0 to 3)$^+$	405.82	(0 to 3$^+$)			
122.0 *4*	†	405.82	(0 to 3$^+$)	284.53	(1,2)$^-$			
136.9 *2*	13.5 *5*	284.53	(1,2)$^-$	147.72	1$^+$	E1	0.106	α(K)exp=0.070 *10*; α(L)exp=0.016 *4* α(K)=0.091; α(L)=0.0124; α(M)=0.00259; α(N+..)=0.00068
137.1 *3*	†	724.83	(≤3)	587.44	(0 to 3)$^+$			
140.6 *2*	11.3 *9*	288.16	(0 to 3)$^+$	147.72	1$^+$	M1	0.501	α(K)exp=0.44 *7*; α(L)exp=0.075 *13* α(K)=0.427; α(L)=0.0585; α(M)=0.0123; α(N+..)=0.00336
147.7 *2*	100.0 *15*	147.72	1$^+$	0.0	(2)$^+$	M1	0.436	α(K)exp=0.36 *4*; α(L)exp=0.068 *3*; α(M)exp=0.015 *3* α(K)=0.372; α(L)=0.0509; α(M)=0.0107; α(N+..)=0.00292
183.2 *4*	†	526.15	(0 to 3)$^+$	342.90	(0 to 3)$^+$			

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^{132}Nd ε decay (94 s) 1995Bu11 (continued)

γ(^{132}Pr) (continued)

E_{γ}	I_{γ}‡	E_i(level)	J^{π}_i	E_f	J^{π}_f	Mult.	α#	Comments
195.2 *1*	8.3 *11*	342.90	(0 to 3)$^+$	147.72	1$^+$	M1,E2	0.204	α(K)exp=0.22 *5*; α(L)exp=0.038 *10* α(K)=0.163 *9*; α(L)=0.032 *9*; α(M)=0.0070 *21*; α(N+..)=0.0019 *6*
199.1 *3*	0.9 *2*	724.83	(≤3)	526.15	(0 to 3)$^+$			
213.3 *2*	4.2 *1*	501.34	(0 to 3)$^+$	288.16	(0 to 3)$^+$	M1,E2	0.156	α(K)exp=0.124 *17* α(K)=0.126 *10*; α(L)=0.024 *6*; α(M)=0.0051 *13*; α(N+..)=0.0014 *4*
224.6 *3*	1.3 *2*	630.42	(0 to 3$^+$)	405.82	(0 to 3$^+$)			
237.8 *3*	1.3 *1*	526.15	(0 to 3)$^+$	288.16	(0 to 3)$^+$	(M1,E2)	0.113 *6*	α(K)=0.092 *9*; α(L)=0.016 *3*; α(M)=0.0035 *7*; α(N+..)=0.00094 *16* α(K)exp=0.096 *24* for 239.6+237.8.
239.6 *3*	2.6 *4*	387.20	(0 to 3)$^+$	147.72	1$^+$	(M1,E2)	0.110 *6*	α(K)=0.090 *9*; α(L)=0.016 *3*; α(M)=0.0034 *7*; α(N+..)=0.00092 *16* α(K)exp=0.096 *24* for 239.6+237.8.
257.4 *3*	0.6 *2*	981.85	(0$^+$ to 3$^+$)	724.83	(≤3)			
284.5 *2*	8.8 *5*	284.53	(1,2)$^-$	0.0	(2)$^+$	E1	0.0149	α(K)exp=0.016 *5* α(K)=0.0128; α(L)=0.00169; α(M)=0.00035
288.2 *2*	6.2 *8*	288.16	(0 to 3)$^+$	0.0	(2)$^+$	M1,E2	0.064 *7*	α(K)exp=0.09 *3* α(K)=0.053 *8*; α(L)=0.0087 *6*; α(M)=0.00186 *16*; α(N+..)=0.00050 *4*
299.0 *3*	1.8 *4*	587.44	(0 to 3)$^+$	288.16	(0 to 3)$^+$	M1	0.0642	α(K)exp=0.056 *15* α(K)=0.0549; α(L)=0.00738; α(M)=0.00155; α(N+..)=0.00042
310.0 *4*	†	714.94	1$^+$	405.82	(0 to 3$^+$)			
319.0 *4*	†	724.83	(≤3)	405.82	(0 to 3$^+$)			
342.8 *3*	1.2 *6*	342.90	(0 to 3)$^+$	0.0	(2)$^+$			
352.8 *3*	4.2 *3*	501.34	(0 to 3)$^+$	147.72	1$^+$			
372.0 *4*	0.7 *2*	714.94	1$^+$	342.90	(0 to 3)$^+$			
378.6 *2*	5.0 *2*	526.15	(0 to 3)$^+$	147.72	1$^+$	M1,E2	0.030 *5*	α(K)exp=0.027 *7* α(K)=0.025 *5*; α(L)=0.00379 *17*; α(M)=0.00080 *3*; α(N+..)=0.00022 *1*
382.2 *4*	1.9 *3*	724.83	(≤3)	342.90	(0 to 3)$^+$			
414.2 *3*	1.7 *2*	981.85	(0$^+$ to 3$^+$)	567.49	(0 to 3$^+$)			
419.7 *2*	3.3 *2*	567.49	(0 to 3$^+$)	147.72	1$^+$			
426.8 *2*	2.6 *2*	714.94	1$^+$	288.16	(0 to 3)$^+$			
430.4 *2*	13.2 *9*	714.94	1$^+$	284.53	(1,2)$^-$	E1	0.00533	α(K)exp=0.0076 *21* α=0.00533; α(K)=0.00458; α(L)=0.00059; α(M)=0.00012
440.0 *3*	2.3 *6*	724.83	(≤3)	284.53	(1,2)$^-$			
449.0 *4*	†	854.9	(0 to 3$^+$)	405.82	(0 to 3$^+$)			
455.0 *4*	†	861.23	(0 to 4$^-$)	405.82	(0 to 3$^+$)			
482.7 *3*	<2.8	630.42	(0 to 3$^+$)	147.72	1$^+$			
501.4 *3*	1.4 *4*	501.34	(0 to 3)$^+$	0.0	(2)$^+$			
567.0 *2*	21.7 *4*	714.94	1$^+$	147.72	1$^+$	M1	0.0126	α(K)exp=0.013 *2* α(K)=0.0107; α(L)=0.00141
576.8 *2*	2.8 *3*	861.23	(0 to 4$^-$)	284.53	(1,2)$^-$			
693.7 *3*	1.9 *8*	981.85	(0$^+$ to 3$^+$)	288.16	(0 to 3)$^+$			
707.2 *3*	1.3 *1*	854.9	(0 to 3$^+$)	147.72	1$^+$			
725.2 *3*	2.6 *11*	724.83	(≤3)	0.0	(2)$^+$			
834.2 *3*	2.7 *2*	981.85	(0$^+$ to 3$^+$)	147.72	1$^+$			
981.3 *4*	6.1 *4*	981.85	(0$^+$ to 3$^+$)	0.0	(2)$^+$			
1041.7 *4*	2.4 *4*	1330.1	(0 to 3$^+$)	288.16	(0 to 3)$^+$			
1045.7 *4*	3.4 *4*	1330.1	(0 to 3$^+$)	284.53	(1,2)$^-$			

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^{132}Nd ε decay (94 s) 1995Bu11 (continued)

γ(^{132}Pr) (continued)

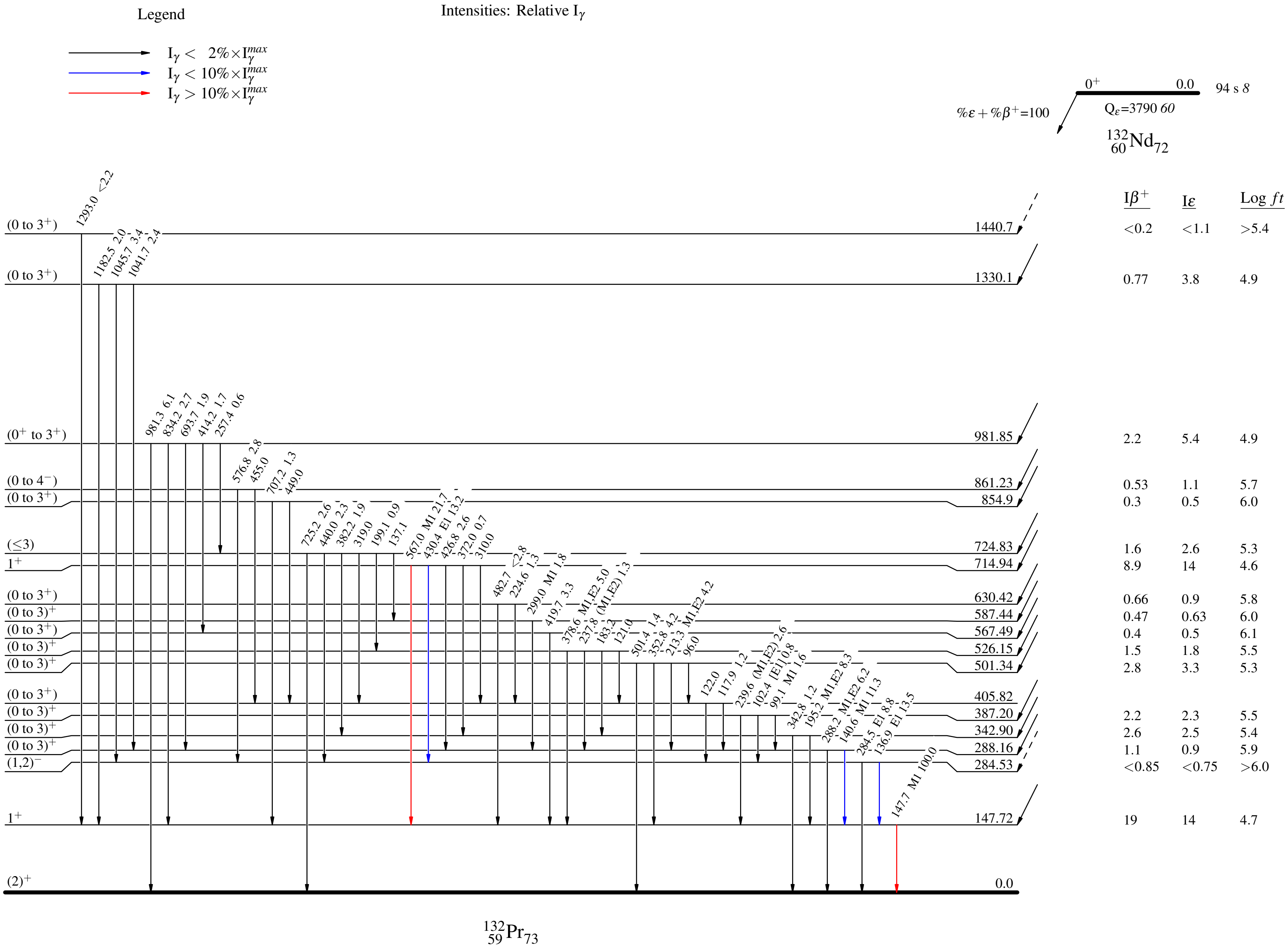
E_γ	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π
1182.5 *4*	2.0 *3*	1330.1	(0 to 3^+)	147.72	1^+
1293.0 *5*	<2.2	1440.7	(0 to 3^+)	147.72	1^+

† Weak transition.
‡ For absolute intensity per 100 decays, multiply by 0.588 *10*.
\# 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.

^{132}Nd ε decay (94 s) 1995Bu11

Decay Scheme

Intensities: Relative I_γ



Level	J^π	$I\beta^+$	$I\varepsilon$	Log ft
1440.7	(0 to 3+)	<0.2	<1.1	>5.4
1330.1	(0 to 3+)	0.77	3.8	4.9
981.85	(0+ to 3+)	2.2	5.4	4.9
861.23	(0 to 4−)	0.53	1.1	5.7
854.9	(0 to 3+)	0.3	0.5	6.0
724.83	(≤3)	1.6	2.6	5.3
714.94	1+	8.9	14	4.6
630.42	(0 to 3+)	0.66	0.9	5.8
587.44	(0 to 3)+	0.47	0.63	6.0
567.49	(0 to 3+)	0.4	0.5	6.1
526.15	(0 to 3)+	1.5	1.8	5.5
501.34	(0 to 3)+	2.8	3.3	5.3
405.82	(0 to 3+)			
387.20	(0 to 3)+	2.2	2.3	5.5
342.90	(0 to 3)+	2.6	2.5	5.4
288.16	(0 to 3)+	1.1	0.9	5.9
284.53	(1,2)−	<0.85	<0.75	>6.0
147.72	1+	19	14	4.7
0.0	(2)+			

From ENSDF

$^{132}_{59}$Pr$_{73}$-5