^{149}Pr β^- decay (2.26 min) 1977Pi06,2010Ru09,1997Gr09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 185, 2 (2022)	23-Aug-2022

Parent: ^{149}Pr: E=0; J$^\pi$=(5/2$^+$); $T_{1/2}$=2.26 min *8*; Q(β^-)=3336 *10*; %β^- decay=100.0

^{149}Pr-J$^\pi$,$T_{1/2}$: From ^{149}Pr Adopted Levels.

^{149}Pr-Q(β^-): From 2021Wa16.

1977Pi06 (also 1976RoYT): measured Eγ, Iγ, $\gamma\gamma$-coin at Grenoble and at the Kernforschungsanlage Julich.

2010Ru09: main emphasis in this work is the measurement of the half-lives of 14 levels in ^{149}Nd using advanced fast-timing techniques in $\beta\gamma\gamma$ coin studies at Studsvik. Some new γ rays and levels were also reported. The ^{149}Pr source was obtained from decay chain starting from ^{149}Cs and ^{149}Ba (^{149}Cs –> ^{149}Ba –> ^{149}La –> ^{149}Ce –> ^{149}Pr). The ^{149}Cs and ^{149}Ba were produced in ^{235}U(n,F), E=thermal at OSIRIS on-line fission-product mass separator facility in Studsvik. The A=149 activities were mass separated and deposited on a mylar tape. Measured $\beta\gamma\gamma$ using NE111A plastic scintillator, one low- energy x-ray detector and a 50% HPGe detector. Lifetime measurements were made by $\beta\gamma\gamma$(t) using fast timing coincidence between NE111A β detector and BaF_2 γ detector together with coin requirement with a γ ray detected in a Ge detector.

1997Gr09, 1996Gr20: total absorption γ-ray spectra (TAGS) at the Idaho National Engineering Lab, deduced β feedings.

2014Ko27: measured level half-lives by $\gamma\gamma$(t).

Others:

1995Ik03: measured Q(β^-)=3390 *70* from $\beta\gamma$-coin.

1977Pf01: Eγ, Iγ, most of the γ rays are the same as in 1977Pi06.

1976Sk04: Eγ, $\gamma\gamma$ for intense transitions.

1974Bu09: Eγ, $T_{1/2}$ of ^{149}Pr decay.

1973Oh08: Eγ, $T_{1/2}$ of ^{149}Pr decay.

1967Va14: β, γ (five intense γ rays reported).

1964Ho03: $T_{1/2}$ of ^{149}Pr decay.

The level scheme as given here is incomplete as compared with the TAGS data of 1997Gr09 (also 1996Gr20). For example 1997Gr09 obtain 55% β feeding to levels above 920.7. For low-lying excited levels (108.5-403.7), 1997Gr09 obtain total β feeding of 5.5%, whereas the gamma-ray intensity balance in the proposed level scheme gives about 50%.

Total decay energy deposit of 2997 keV *66* calculated by RADLIST code is somewhat lower than the expected value of 3336 keV *10* (2021Wa16), which could indicate the incompleteness of the decay scheme.

^{149}Nd Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[#]	Comments
0.0	5/2$^-$	1.726 h *5*	$T_{1/2}$: from the Adopted Levels.
108.54 *4*	7/2$^-$	0.19 ns *8*	$T_{1/2}$: unweighted average of 0.11 ns *3* (2014Ko27, from average of three values for (162γ)(109γ)(t), (208γ)(109γ)(t), and (224γ)(109γ)(t)) and 278 ps *27* (2010Ru09, $\beta\gamma\gamma$(t)).
138.44 *3*	5/2$^-$	0.178 ns *38*	$T_{1/2}$: unweighted average of 0.14 ns *3* (2014Ko27, from average of three values for (120γ)(138γ)(t), (227γ)(138γ)(t), and (433γ)(138γ)(t)) and 216 ps *14* (2010Ru09, $\beta\gamma\gamma$(t)).
165.12 *3*	1/2$^-$,3/2$^-$	73 ps *11*	$T_{1/2}$: from $\beta\gamma\gamma$(t) (2010Ru09).
220.73 *8*	9/2$^-$	1.61 ns *4*	$T_{1/2}$: from the Adopted Levels. 1.60 ns *4* from weighted average of 1.60 ns *4* (2014Ko27, (112γ+109γ)(t)) and 1.65 ns *19* (2010Ru09, $\beta\gamma\gamma$(t)).
258.33 *3*	3/2$^-$	0.203 ns *8*	$T_{1/2}$: weighted average of 0.22 ns *3* (2014Ko27, average of three values for (313γ)(258γ)(t), (623γ)(258γ)(t), and (662γ)(258γ)(t)) and 202 ps *8* (2010Ru09, $\beta\gamma\gamma$(t)).
270.69 *6*	(9/2$^+$)	0.42 ns *3*	$T_{1/2}$: weighted average of 0.42 ns *3* (2014Ko27, (162γ+109γ)(t)) and 424 ps *60* (2010Ru09, $\beta\gamma\gamma$(t)).
285.48 *3*	1/2$^-$	126 ps *13*	$T_{1/2}$: from $\beta\gamma\gamma$(t) (2010Ru09).
316.25 *4*	(5/2$^-$,7/2$^-$)	56 ps *11*	$T_{1/2}$: from $\beta\gamma\gamma$(t) (2010Ru09).
321.17 *4*	(5/2$^-$,7/2$^-$)	74 ps *17*	$T_{1/2}$: from $\beta\gamma\gamma$(t) (2010Ru09).
332.99 *4*	5/2$^+$	14 ps *8*	$T_{1/2}$: from $\beta\gamma\gamma$(t) (2010Ru09).
365.84 *6*	3/2$^-$		

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^{149}Pr β^- decay (2.26 min) 1977Pi06,2010Ru09,1997Gr09 (continued)

^{149}Nd Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$[#]	Comments
403.76 *3*	1/2$^-$	23 ps *8*	$T_{1/2}$: from $\beta\gamma\gamma$(t) (2010Ru09).
449.85 *7*	5/2$^-$	≤10 ps	$T_{1/2}$: $\beta\gamma\gamma$(t) (2010Ru09). Level proposed by 2010Ru09, with the two new γ rays of 285.8 and 341.31 from this level, which do not fit well in the decay scheme within the quoted uncertainties.
459.53 *4*	(3/2$^-$,5/2$^-$)	31 ps *14*	$T_{1/2}$: $\beta\gamma\gamma$(t) (2010Ru09).
474.63 *5*	(5/2$^+$,7/2)	≤10 ps	$T_{1/2}$: $\beta\gamma\gamma$(t) (2010Ru09).
482.71 *4*	1/2$^+$		
517.43 *6*	(3/2,5/2,7/2)		
548.70 *4*	3/2$^-$		
571.44 *4*	3/2$^+$		
593.09 *7*	(5/2$^+$)		E(level): level proposed by 2010Ru09.
603.44 *9*			E(level): level proposed by 2010Ru09.
705.01 *11*	(3/2,5/2)		
709.45 *9*	(3/2,5/2$^-$)		
741.51 *16*	3/2$^+$		
814.35 *9*	1/2$^+$		
862.81 *10*	(7/2)$^+$		E(level): level proposed by 2010Ru09.
881.36 *8*	3/2$^+$		
920.66 *7*	(3/2,5/2,7/2$^-$)		
1000[@] *50*			
1012.6? *3*			E(level): level proposed by 2010Ru09, considered as uncertain by the evaluators, as it is not supported by $\gamma\gamma$-coin data.
1100[@] *50*			
1200[@] *50*			
1300[@] *50*			
1400[@] *50*			
1500[@] *50*			
1600[@] *50*			
1700[@] *50*			
1800[@] *50*			
1900[@] *50*			
2000[@] *50*			
2100[@] *50*			
2200[@] *50*			
2300[@] *50*			
2400[@] *50*			
2500[@] *50*			
2600[@] *50*			
2700[@] *50*			
2800[@] *50*			
2900[@] *50*			
3000[@] *50*			
3100[@] *50*			

[†] From least-squares fit to Eγ data. As indicated by comments, 285γ from 450 level was not used in the least-squares fit procedure, due to its very poor fit, the deviation being ≈1 keV. Uncertainties of three γ rays from the 709 level were doubled in the fitting procedure to obtain an acceptable reduced χ^2 fit, consistent with critical reduced χ^2 of 1.5. Without the above adjustments, reduced χ^2 is 4.3.

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^{149}Pr β^- decay (2.26 min) 1977Pi06,2010Ru09,1997Gr09 (continued)

^{149}Nd Levels (continued)

‡ From the Adopted Levels.
# From this dataset, unless otherwise noted. Quoted values are the same in the Adopted Levels.
@ Pseudolevel from β feeding deduced from TAGS (total absorption γ ray spectra) data (1997Gr09). Uncertainty of 50 keV assigned by the evaluators based on choice of 100 keV bins for the TAGS spectrum of 1997Gr09.

β^- radiations

E(decay)	E(level)	Iβ^-†‡	Log *ft*†	Comments
(2.4×10^2 *5*)	3100	0.034	5.1	av Eβ=65 *16*
(3.4×10^2 *5*)	3000	0.085	5.2	av Eβ=97 *17*
(4.4×10^2 *5*)	2900	0.18	5.3	av Eβ=130 *18*
(5.4×10^2 *5*)	2800	0.57	5.1	av Eβ=165 *19*
(6.4×10^2 *5*)	2700	1.0	5.1	av Eβ=201 *19*
(7.4×10^2 *5*)	2600	1.6	5.1	av Eβ=238 *20*
(8.4×10^2 *5*)	2500	3.2	5.0	av Eβ=277 *20*
(9.4×10^2 *5*)	2400	4.1	5.1	av Eβ=316 *21*
(1.04×10^3 *5*)	2300	3.6	5.3	av Eβ=356 *21*
(1.14×10^3 *5*)	2200	3.4	5.4	av Eβ=397 *21*
(1.24×10^3 *5*)	2100	12.7	5.0	av Eβ=438 *22*
(1.34×10^3 *5*)	2000	11.8	5.2	av Eβ=480 *22*
(1.44×10^3 *5*)	1900	0.87	6.4	av Eβ=523 *22*
(1.54×10^3 *5*)	1800	1.6	6.3	av Eβ=566 *22*
(1.64×10^3 *5*)	1700	1.3	6.5	av Eβ=609 *23*
(1.74×10^3 *5*)	1600	1.0	6.7	av Eβ=653 *23*
(1.84×10^3 *5*)	1500	1.4	6.6	av Eβ=697 *23*
(1.94×10^3 *5*)	1400	1.8	6.6	av Eβ=741 *23*
(2.04×10^3 *5*)	1300	1.3	6.8	av Eβ=786 *23*
(2.14×10^3 *5*)	1200	1.1	7.0	av Eβ=830 *23*
(2.24×10^3 *5*)	1100	1.1	7.1	av Eβ=875 *23*
(2323# *10*)	1012.6?	0.80 *15*	7.3	av Eβ=914.7 *46* Iβ^-: from intensity balance; value not available from TAGS data.
(2.34×10^3 *5*)	1000	0.87	7.3	av Eβ=920 *23*
(2415 *10*)	920.66	6.6	6.4	av Eβ=956.2 *46* Iβ^-: intensity balance gives 5.2 *9*. E(decay): 2430 *160* ($\beta\gamma$,1995Ik03).
(2455 *10*)	881.36	4.5	6.6	av Eβ=974.0 *46* Iβ^-: intensity balance gives 3.6 *6*. E(decay): 2490 *160* ($\beta\gamma$,1995Ik03).
(2473 *10*)	862.81	0.65 *14*	7.5	av Eβ=982.5 *46* Iβ^-: from intensity balance; value not available from TAGS data.
(2522# *10*)	814.35	3.2	6.8	av Eβ=1004.5 *46* Iβ^-: intensity balance gives 1.13 *24*, including contributions identified in (n,γ) by 1976Pi04; expected to be negligible due to ΔJ=2 and $\Delta\pi$=no for the β transition.
(2594 *10*)	741.51	0.39	7.8	av Eβ=1037.6 *46* Iβ^-: intensity balance gives 0.45 *12*, including contributions identified in (n,γ) by 1976Pi04.
(2627 *10*)	709.45	1.0	7.4	av Eβ=1052.2 *46* Iβ^-: intensity balance gives 1.9 *4*, including contributions identified in (n,γ) by 1976Pi04.
(2631 *10*)	705.01	1.1	7.4	av Eβ=1054.2 *46* Iβ^-: intensity balance gives 2.3 *5*.
(2733 *10*)	603.44	0.89 *21*	7.5	av Eβ=1100.6 *46* Iβ^-: from intensity balance; value not available from TAGS data.

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^{149}Pr β^- decay (2.26 min) 1977Pi06,2010Ru09,1997Gr09 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^- †‡	Log *ft* †	Comments
(2743 *10*)	593.09	1.5 *3*	7.3	av Eβ=1105.3 *46* Iβ^-: from intensity balance; value not available from TAGS data.
(2765 *10*)	571.44	5.5	6.8	av Eβ=1115.2 *46* E(decay): 2820 *190* ($\beta\gamma$,1995Ik03). Iβ^-: intensity balance gives 6.8 *11*, including contributions identified in (n,γ) by 1976Pi04.
(2787 *10*)	548.70	0.78	7.6	av Eβ=1125.6 *46* Iβ^-: intensity balance gives 2.0 *4*, including contributions identified in (n,γ) by 1976Pi04.
(2819 *10*)	517.43	2.1	7.2	av Eβ=1139.9 *46* E(decay): 2970 *220* ($\beta\gamma$,1995Ik03). Iβ^-: intensity balance gives 5.5 *9*.
(2853# *10*)	482.71	0.36	8.0	av Eβ=1155.8 *46* Iβ^-: intensity balance gives 0.55 *16*, including contributions identified in (n,γ) by 1976Pi04. ΔJ=2 $\Delta\pi$=+ requires negligible β feeding.
(2861 *10*)	474.63	2.1	7.2	av Eβ=1159.5 *46* Iβ^-: intensity balance gives 4.7 *8*.
(2876 *10*)	459.53	0.97	7.6	av Eβ=1166.4 *46* Iβ^-: intensity balance gives 2.9 *7*, including contributions identified in (n,γ) by 1976Pi04.
(2886 *10*)	449.85	1.4 *3*	7.4	av Eβ=1170.8 *46* Iβ^-: from intensity balance; value from TAGS data not available.
(2932# *10*)	403.76	0.0		Iβ^-: intensity balance gives 1.9 *4*, including contributions identified in (n,γ) by 1976Pi04.
(2970# *10*)	365.84	0.0		Iβ^-: intensity balance gives 2.3 *5*, including contributions identified in (n,γ) by 1976Pi04.
(3003 *10*)	332.99	1.4	7.5	av Eβ=1224.4 *46* Iβ^-: intensity balance gives 4.4 *8*, including contributions identified in (n,γ) by 1976Pi04.
(3015 *10*)	321.17	1.6	7.4	av Eβ=1229.9 *46* Iβ^-: intensity balance gives 6.0 *10*.
(3020 *10*)	316.25	1.1	7.6	av Eβ=1232.1 *46* Iβ^-: intensity balance gives 4.2 *8*, including contributions identified in (n,γ) by 1976Pi04.
(3051# *10*)	285.48	0.0		Iβ^-: intensity balance gives 1.9 *4*, including contributions identified in (n,γ) by 1976Pi04.
(3065# *10*)	270.69	0.0		Iβ^-: intensity balance gives 1.9 *4*, expected to be negligible, based on ΔJ=2, $\Delta\pi$=no, involved in β transition.
(3078# *10*)	258.33	0.0		Iβ^-: intensity balance gives 3.6 *8*.
(3115# *10*)	220.73	0.0		Iβ^-: intensity balance gives 2.4 *8*.
(3171# *10*)	165.12	0.0		Iβ^-: intensity balance gives <1.3.
(3198 *10*)	138.44	0.56	8.0	av Eβ=1313.9 *46* Iβ^-: intensity balance gives 4.0 *9*.
(3227 *10*)	108.54	0.87	7.8	av Eβ=1327.7 *46* Iβ^-: intensity balance gives 4.5 *14*.
(3336 *10*)	0.0	11.4 *14*	6.77 *6*	av Eβ=1377.8 *47* E(decay): 3000 *200* from 1967Va14. Iβ^-: from TAGS data of 1996Gr20.

† β feedings are from TAGS data in 1997Gr09, unless otherwise noted. The β feedings deduced from γ-ray intensity balances are given under comments which differ significantly from those deduced from TAGS data of 1997Gr09. Since there are 29 unplaced γ rays with a total intensity of 15%, and multipolarities of several γ rays are unknown, the present decay scheme is likely to be

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^{149}Pr β^- decay (2.26 min) 1977Pi06,2010Ru09,1997Gr09 (continued)

β^- radiations (continued)

incomplete, thus the Iβ values listed in comments can only be considered as upper limits.

‡ Absolute intensity per 100 decays.

Existence of this branch is questionable.

γ(^{149}Nd)

Iγ normalization: 1977Pi06 provide in Table 1 intensities per 100 decays with statistical uncertainties, with a statement that 15% uncertainty from arising from calibration procedure is not included. Summed I(γ+ce)(to g.s.)=88.6 *14*, obtained from 100−(measured Iβ=11.4 *14* to g.s.) gives γ-normalization factor of 1.109 *26*, which agrees with 1.00 *15* within the uncertainties, however, note that the uncertainty in normalization factor of 1.109 *26* is based on γ-ray intensities with statistical uncertainties only.

E_γ[†]	I_γ[†ch]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α[i]	Comments
88.731[e] *4*	0.053 *8*	571.44	3/2+	482.71	1/2+	[M1+E2]	2.7 *7*	%Iγ=0.053 *11* α(K)=1.689 *25*; α(L)=0.8 *5*; α(M)=0.18 *13* α(N)=0.038 *27*; α(O)=0.0050 *33*; α(P)=9.1×10^{-5} *19*
93.11 *8*	0.50 *5*	258.33	3/2−	165.12	1/2−,3/2−	[M1][g]	1.737 *25*	%Iγ=0.50 *9* α(K)=1.477 *21*; α(L)=0.2058 *29*; α(M)=0.0437 *6* α(N)=0.00978 *14*; α(O)=0.001484 *21*; α(P)=9.57×10^{-5} *14*
[x]103.99[#] *16*	0.70 *21*							%Iγ=0.70 *23*
108.51 *6*	9.5 *4*	108.54	7/2−	0.0	5/2−	[M1][g]	1.122 *16*	%Iγ=9.5 *15* α(K)=0.954 *13*; α(L)=0.1326 *19*; α(M)=0.0281 *4* α(N)=0.00630 *9*; α(O)=0.000957 *13*; α(P)=6.18×10^{-5} *9*
112.12[#] *9*	1.0 *3*	220.73	9/2−	108.54	7/2−	[M1+E2]	1.24 *22*	%Iγ=1.00 *34* α(K)=0.867 *12*; α(L)=0.29 *17*; α(M)=0.06 *4* α(N)=0.014 *8*; α(O)=0.0019 *10*; α(P)=4.8×10^{-5} *9*
117.19[#] *17*	0.40 *8*	482.71	1/2+	365.84	3/2−	[E1]	0.1679 *24*	%Iγ=0.40 *10* α(K)=0.1426 *21*; α(L)=0.02007 *29*; α(M)=0.00424 *6* α(N)=0.000935 *14*; α(O)=0.0001357 *20*; α(P)=7.26×10^{-6} *11*
119.885[b] *1*	0.61[b] *3*	258.33	3/2−	138.44	5/2−	[M1+E2]	1.00 *15*	%Iγ=0.61 *10* α(K)=0.714 *11*; α(L)=0.22 *12*; α(M)=0.049 *28* α(N)=0.011 *6*; α(O)=0.0015 *7*; α(P)=3.9×10^{-5} *7* Eγ: poor fit, level-energy difference=119.836.
120.30 *6*	1.40 *8*	285.48	1/2−	165.12	1/2−,3/2−	[M1][g]	0.837 *12*	%Iγ=1.40 *22* α(K)=0.711 *10*; α(L)=0.0988 *14*; α(M)=0.02097 *30* α(N)=0.00469 *7*; α(O)=0.000713 *10*; α(P)=4.61×10^{-5} *6*
[x]129.3[#] *4*	0.26 *16*							%Iγ=0.26 *16*
[x]134.07[#] *25*	0.36 *14*							%Iγ=0.36 *15*
138.46 *5*	11.02 *33*	138.44	5/2−	0.0	5/2−	[M1][g]	0.563 *8*	%Iγ=11.0 *17* α(K)=0.479 *7*; α(L)=0.0663 *9*; α(M)=0.01407 *20* α(N)=0.00315 *4*; α(O)=0.000479 *7*; α(P)=3.10×10^{-5} *4* Measured Iγ/100 decays=11.0 *17* (1977Pi06 give 15% uncertainty for absolute intensities). Other: Iγ(138.46γ)/100 decays=13 *5* (1967Va14).
143.31[#] *20*	0.60 *25*	459.53	(3/2−,5/2−)	316.25	(5/2−,7/2−)	[M1+E2]	0.56 *5*	%Iγ=0.60 *27* α(K)=0.423 *13*; α(L)=0.11 *5*; α(M)=0.024 *11* α(N)=0.0053 *24*; α(O)=7.3×10^{-4} *29*; α(P)=2.4×10^{-5} *4*

γ(^{149}Nd) (continued)

E_γ[†]	I_γ[†ch]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α[i]	Comments
145.92 *20*	0.40 *16*	403.76	1/2⁻	258.33	3/2⁻	[M1][g]	0.486 *7*	%Iγ=0.40 *17* α(K)=0.413 *6*; α(L)=0.0572 *8*; α(M)=0.01214 *18* α(N)=0.00272 *4*; α(O)=0.000413 *6*; α(P)=2.68×10⁻⁵ *4* Placement proposed by 2010Ru09 based on possible γγ-coin evidence. The γ was unplaced in 1977Pi06.
147.036[e] *2*	0.062[e] *7*	285.48	1/2⁻	138.44	5/2⁻	[E2]	0.561 *8*	%Iγ=0.062 *12* α(K)=0.380 *5*; α(L)=0.1414 *20*; α(M)=0.0318 *4* α(N)=0.00691 *10*; α(O)=0.000917 *13*; α(P)=1.803×10⁻⁵ *25*
149.8[#] *3*	0.26 *16*	258.33	3/2⁻	108.54	7/2⁻	[E2]	0.526 *8*	%Iγ=0.26 *16* α(K)=0.358 *5*; α(L)=0.1307 *21*; α(M)=0.0294 *5* α(N)=0.00639 *10*; α(O)=0.000848 *14*; α(P)=1.709×10⁻⁵ *26*
151.120[e] *20*	0.19[e] *3*	316.25	(5/2⁻,7/2⁻)	165.12	1/2⁻,3/2⁻	[M1,E2]	0.475 *35*	%Iγ=0.19 *4* α(K)=0.362 *14*; α(L)=0.09 *4*; α(M)=0.020 *9* α(N)=0.0043 *18*; α(O)=6.0×10⁻⁴ *22*; α(P)=2.0×10⁻⁵ *4*
156.04 *5*	1.40[&] *14*	321.17	(5/2⁻,7/2⁻)	165.12	1/2⁻,3/2⁻	[M1][g]	0.403 *6*	%Iγ=1.40 *25* α(K)=0.343 *5*; α(L)=0.0474 *7*; α(M)=0.01005 *14* α(N)=0.002251 *32*; α(O)=0.000342 *5*; α(P)=2.218×10⁻⁵ *31*
162.30 *8*	3.1 *2*	270.69	(9/2⁺)	108.54	7/2⁻	[E1]	0.0690 *10*	%Iγ=3.1 *5* α(K)=0.0588 *8*; α(L)=0.00807 *11*; α(M)=0.001703 *24* α(N)=0.000377 *5*; α(O)=5.54×10⁻⁵ *8*; α(P)=3.12×10⁻⁶ *4*
165.08 *6*	9.9 *4*	165.12	1/2⁻,3/2⁻	0.0	5/2⁻	[M1][g]	0.345 *5*	%Iγ=9.9 *15* α(K)=0.293 *4*; α(L)=0.0405 *6*; α(M)=0.00859 *12* α(N)=0.001923 *27*; α(O)=0.000292 *4*; α(P)=1.896×10⁻⁵ *27*
[x]172.92[#] *6*	0.60 *7*							%Iγ=0.60 *11*
174.031[e] *18*	0.10[e] *3*	459.53	(3/2⁻,5/2⁻)	285.48	1/2⁻	[M1,E2]	0.306 *9*	%Iγ=0.100 *34* α(K)=0.239 *15*; α(L)=0.052 *18*; α(M)=0.012 *4* α(N)=0.0025 *9*; α(O)=3.6×10⁻⁴ *10*; α(P)=1.37×10⁻⁵ *27*
[x]175.70[#] *14*	0.25 *5*							%Iγ=0.25 *6*
177.73 *7*	0.50[@] *5*	316.25	(5/2⁻,7/2⁻)	138.44	5/2⁻	[M1+E2]	0.286 *7*	%Iγ=0.50 *9* α(K)=0.225 *15*; α(L)=0.049 *16*; α(M)=0.011 *4* α(N)=0.0023 *8*; α(O)=3.3×10⁻⁴ *9*; α(P)=1.29×10⁻⁵ *25*
182.55 *7*	1.00 *5*	321.17	(5/2⁻,7/2⁻)	138.44	5/2⁻	[M1+E2]	0.264 *5*	%Iγ=1.00 *16* α(K)=0.208 *15*; α(L)=0.044 *13*; α(M)=0.0097 *32* α(N)=0.0021 *7*; α(O)=3.0×10⁻⁴ *8*; α(P)=1.20×10⁻⁵ *24*
197.13[#] *17*	0.27 *7*	482.71	1/2⁺	285.48	1/2⁻	[E1]	0.0408 *6*	%Iγ=0.27 *8* α(K)=0.0348 *5*; α(L)=0.00473 *7*; α(M)=0.000997 *14* α(N)=0.0002210 *31*; α(O)=3.27×10⁻⁵ *5*; α(P)=1.887×10⁻⁶ *27*
204.15[d] *10*	0.40[d] *4*	474.63	(5/2⁺,7/2)	270.69	(9/2⁺)	[D,E2]	0.11 *7*	%Iγ=0.40 *7*
207.67 *20*	2.75 *14*	316.25	(5/2⁻,7/2⁻)	108.54	7/2⁻	[M1+E2]	0.178 *6*	%Iγ=2.8 *4* α(K)=0.142 *14*; α(L)=0.028 *6*; α(M)=0.0061 *15* α(N)=0.00134 *32*; α(O)=0.00019 *4*; α(P)=8.3×10⁻⁶ *17*

γ(^{149}Nd) (continued)

E_γ[†]	I_γ[†ch]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[i]	Comments
212.65 *10*	1.00 *5*	321.17	(5/2$^-$,7/2$^-$)	108.54	7/2$^-$	[M1+E2]	0.166 *7*	%Iγ=1.00 *16* α(K)=0.133 *13*; α(L)=0.026 *6*; α(M)=0.0056 *13* α(N)=0.00124 *28*; α(O)=0.000176 *31*; α(P)=7.8×10^{-6} *16*
215.67[#] *15*	0.40 *8*	548.70	3/2$^-$	332.99	5/2$^+$	[E1]	0.0321 *5*	%Iγ=0.40 *10* α(K)=0.0274 *4*; α(L)=0.00370 *5*; α(M)=0.000781 *11* α(N)=0.0001732 *24*; α(O)=2.57×10^{-5} *4*; α(P)=1.498×10^{-6} *21*
220.76[#] *16*	0.40 *6*	220.73	9/2$^-$	0.0	5/2$^-$	[E2]	0.1409 *20*	%Iγ=0.40 *8* α(K)=0.1064 *15*; α(L)=0.0270 *4*; α(M)=0.00599 *9* α(N)=0.001309 *19*; α(O)=0.0001795 *26*; α(P)=5.52×10^{-6} *8*
224.25 *11*	0.40 *5*	332.99	5/2$^+$	108.54	7/2$^-$	[E1]	0.0289 *4*	%Iγ=0.40 *8* α(K)=0.02469 *35*; α(L)=0.00333 *5*; α(M)=0.000702 *10* α(N)=0.0001559 *22*; α(O)=2.312×10^{-5} *33*; α(P)=1.356×10^{-6} *19*
227.36[ja] *7*	0.85[j] *9*	365.84	3/2$^-$	138.44	5/2$^-$	[M1+E2]	0.136 *8*	%Iγ=0.85 *16* α(K)=0.110 *13*; α(L)=0.020 *4*; α(M)=0.0044 *9* α(N)=0.00098 *19*; α(O)=0.000141 *20*; α(P)=6.5×10^{-6} *14* Iγ: combined intensity of the doublet=1.55 *11*.
227.36[ja] *7*	0.70[j] *7*	548.70	3/2$^-$	321.17	(5/2$^-$,7/2$^-$)	[M1+E2]	0.136 *8*	%Iγ=0.70 *13* α(K)=0.110 *13*; α(L)=0.020 *4*; α(M)=0.0044 *9* α(N)=0.00098 *19*; α(O)=0.000141 *20*; α(P)=6.5×10^{-6} *14* Eγ: poor fit, level-energy difference=227.59.
238.453[b] *20*	0.80[b] *8*	571.44	3/2$^+$	332.99	5/2$^+$	[M1+E2]	0.118 *9*	%Iγ=0.80 *14* α(K)=0.096 *12*; α(L)=0.0174 *27*; α(M)=0.0038 *7* α(N)=0.00083 *14*; α(O)=0.000120 *14*; α(P)=5.7×10^{-6} *13* Eγ: other: 238.68 *10* for the unresolved doublet in β$^-$ decay (1977Pi06). Iγ: combined intensity of the doublet=1.00 *7* in β$^-$ decay.
238.638[b] *3*	0.40[b] *4*	403.76	1/2$^-$	165.12	1/2$^-$,3/2$^-$	[M1][g]	0.1258 *18*	%Iγ=0.40 *7* α(K)=0.1072 *15*; α(L)=0.01466 *21*; α(M)=0.00311 *4* α(N)=0.000696 *10*; α(O)=0.0001059 *15*; α(P)=6.90×10^{-6} *10* Eγ: other: 238.68 *10* for the unresolved doublet in β$^-$ decay (1977Pi06). Iγ: combined intensity of the doublet=1.00 *7* in β$^-$ decay. Eγ: poor fit, level-energy difference=238.623.
245.4[#] *3*	0.60 *18*	705.01	(3/2,5/2)	459.53	(3/2$^-$,5/2$^-$)	[D,E2]	0.07 *5*	%Iγ=0.60 *20*
258.27 *10*	5.7 *2*	258.33	3/2$^-$	0.0	5/2$^-$	[M1+E2]	0.093 *9*	%Iγ=5.7 *9* α(K)=0.076 *11*; α(L)=0.0133 *15*; α(M)=0.0029 *4* α(N)=0.00064 *8*; α(O)=9.3×10^{-5} *7*; α(P)=4.5×10^{-6} *10*
260.10[d] *9*	0.64[d] *12*	593.09	(5/2$^+$)	332.99	5/2$^+$	[M1+E2]	0.091 *9*	%Iγ=0.64 *15* α(K)=0.075 *11*; α(L)=0.0130 *14*; α(M)=0.0028 *4* α(N)=0.00062 *7*; α(O)=9.0×10^{-5} *7*; α(P)=4.5×10^{-6} *10*
265.48[‡] *19*	0.47 *6*	403.76	1/2$^-$	138.44	5/2$^-$	[E2]	0.0772 *11*	%Iγ=0.47 *9*

γ(^{149}Nd) (continued)

E_γ [†]	I_γ [†ch]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α [i]	Comments
								α(K)=0.0601 *9*; α(L)=0.01339 *19*; α(M)=0.00295 *4* α(N)=0.000646 *9*; α(O)=9.00×10^{-5} *13*; α(P)=3.23×10^{-6} *5*
[x]277.17[#] *13*	0.30 *6*							%Iγ=0.30 *7*
[x]282.83[#] *20*	0.36 *4*							%Iγ=0.36 *7*
285.8[d] *1*	0.27[d] *5*	449.85	5/2$^-$	165.12	1/2$^-$,3/2$^-$	[M1,E2]	0.069 *8*	%Iγ=0.27 *6* α(K)=0.057 *9*; α(L)=0.0096 *6*; α(M)=0.00207 *17* α(N)=0.000460 *33*; α(O)=6.70×10^{-5} *21*; α(P)=3.4×10^{-6} *8* E_γ: Poor fit. Level-energy difference=284.7. This γ was not used in the used in the least-squares fitting procedure.
[x]288.38[#] *11*	0.30 *6*							%Iγ=0.30 *7*
[x]293.18[#] *20*	0.50 *12*							%Iγ=0.50 *14*
294.44[e] *4*	0.54[e] *14*	459.53	(3/2$^-$,5/2$^-$)	165.12	1/2$^-$,3/2$^-$	[M1,E2]	0.064 *8*	%Iγ=0.54 *16* α(K)=0.053 *9*; α(L)=0.0087 *4*; α(M)=0.00189 *13* α(N)=0.000418 *24*; α(O)=6.11×10^{-5} *13*; α(P)=3.2×10^{-6} *8*
[x]295.14[#] *20*	0.50 *12*							%Iγ=0.50 *14*
[x]301.42[#] *10*	0.50 *7*							%Iγ=0.50 *10*
[x]303.61[#] *15*	0.20 *6*							%Iγ=0.20 *7*
312.91 *15*	0.85 *10*	571.44	3/2$^+$	258.33	3/2$^-$	[E1]	0.01218 *17*	%Iγ=0.85 *16* α(K)=0.01043 *15*; α(L)=0.001386 *19*; α(M)=0.000292 *4* α(N)=6.50×10^{-5} *9*; α(O)=9.71×10^{-6} *14*; α(P)=5.89×10^{-7} *8*
316.35 *10*	2.70 *10*	316.25	(5/2$^-$,7/2$^-$)	0.0	5/2$^-$	[M1+E2]	0.052 *8*	%Iγ=2.7 *4* α(K)=0.043 *8*; α(L)=0.00699 *15*; α(M)=0.00150 *5* α(N)=0.000334 *9*; α(O)=4.89×10^{-5} *10*; α(P)=2.6×10^{-6} *6*
321.28[jb] *10*	2.50[jb] *20*	321.17	(5/2$^-$,7/2$^-$)	0.0	5/2$^-$	[M1+E2]	0.050 *7*	%Iγ=2.5 *4* α(K)=0.041 *7*; α(L)=0.00666 *11*; α(M)=0.00143 *4* α(N)=0.000318 *7*; α(O)=4.67×10^{-5} *12*; α(P)=2.5×10^{-6} *6*
321.28[jbk] *10*	<0.10[jb]	459.53	(3/2$^-$,5/2$^-$)	138.44	5/2$^-$	[M1+E2]	0.050 *7*	%Iγ<0.10 α(K)=0.041 *7*; α(L)=0.00666 *11*; α(M)=0.00143 *4* α(N)=0.000318 *7*; α(O)=4.67×10^{-5} *12*; α(P)=2.5×10^{-6} *6* Placement proposed by 2010Ru09 based on possible $\gamma\gamma$-coin evidence, considered as uncertain by the evaluators.
322.40[d] *4*	0.81[d] *12*	593.09	(5/2$^+$)	270.69	(9/2$^+$)	[E2]	0.0419 *6*	%Iγ=0.81 *17* α(K)=0.0334 *5*; α(L)=0.00664 *9*; α(M)=0.001450 *20* α(N)=0.000319 *4*; α(O)=4.52×10^{-5} *6*; α(P)=1.857×10^{-6} *26*
332.97 *6*	6.15 *30*	332.99	5/2$^+$	0.0	5/2$^-$	[E1]	0.01042 *15*	%Iγ=6.2 *10* α(K)=0.00892 *12*; α(L)=0.001182 *17*; α(M)=0.0002491 *35* α(N)=5.54×10^{-5} *8*; α(O)=8.29×10^{-6} *12*; α(P)=5.06×10^{-7} *7*
[x]336.45[#] *24*	0.60 *6*							%Iγ=0.60 *11*
341.31 *5*	1.1 *1*	449.85	5/2$^-$	108.54	7/2$^-$	[M1+E2]	0.042 *7*	%Iγ=1.10 *19*

From ENSDF

γ(^{149}Nd) (continued)

E_γ[†]	I_γ[†ch]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α[i]	Comments
								α(K)=0.035 *7*; α(L)=0.00554 *12*; α(M)=0.001189 *17* α(N)=0.000264 *4*; α(O)=3.89×10^{-5} *18*; α(P)=2.1×10^{-6} *5* E_γ,I_γ: from 2010Ru09. This γ was reported in 1977Pi06 with Eγ=341.26 *13*, Iγ=0.90 *8* (1977Pi06), but was unplaced.
[x]345.87[#] *40*	0.30 *15*							%Iγ=0.30 *16*
351.2[#] *13*	0.80 *12*	459.53	(3/2$^-$,5/2$^-$)	108.54	7/2$^-$	[M1,E2]	0.039 *6*	%Iγ=0.80 *17* α(K)=0.032 *6*; α(L)=0.00508 *17*; α(M)=0.001090 *24* α(N)=0.000242 *7*; α(O)=3.57×10^{-5} *21*; α(P)=2.0×10^{-6} *5*
[x]355.67[#] *15*	0.60 *12*							%Iγ=0.60 *15*
366.02[ja] *10*	1.7[j] *2*	365.84	3/2$^-$	0.0	5/2$^-$	[M1+E2]	0.035 *6*	%Iγ=1.70 *32* α(K)=0.029 *6*; α(L)=0.00449 *20*; α(M)=0.000962 *31* α(N)=0.000214 *8*; α(O)=3.16×10^{-5} *22*; α(P)=1.8×10^{-6} *5* I_γ: total intensity of the doublet=3.1 *3*.
366.02[ja] *10*	1.4[j] *2*	474.63	(5/2$^+$,7/2)	108.54	7/2$^-$	[D,E2]	0.024 *16*	%Iγ=1.40 *29*
375.95[ef] *8*	0.22 *3*	709.45	(3/2,5/2$^-$)	332.99	5/2$^+$	[D,E2]	0.023 *15*	%Iγ=0.22 *4*
383.61 *18*	0.27 *4*	548.70	3/2$^-$	165.12	1/2$^-$,3/2$^-$	[M1+E2]	0.030 *6*	%Iγ=0.27 *6* α(K)=0.025 *5*; α(L)=0.00391 *24*; α(M)=0.00084 *4* α(N)=0.000186 *10*; α(O)=2.76×10^{-5} *24*; α(P)=1.6×10^{-6} *4*
388.70[ja] *12*	0.60[j] *9*	705.01	(3/2,5/2)	316.25	(5/2$^-$,7/2$^-$)	[D,E2]	0.021 *14*	%Iγ=0.60 *13* I_γ: combined intensity of the doublet=0.80 *10*.
388.70[jaf] *12*	0.20[j] *3*	709.45	(3/2,5/2$^-$)	321.17	(5/2$^-$,7/2$^-$)	[D,E2]	0.021 *14*	%Iγ=0.20 *4*
[x]390.59[#] *16*	0.70 *11*							%Iγ=0.70 *15*
[x]393.32[#] *10*	0.70 *18*							%Iγ=0.70 *21*
403.50[‡] *22*	0.38 *10*	403.76	1/2$^-$	0.0	5/2$^-$	[E2]	0.02143 *30*	%Iγ=0.38 *12* α(K)=0.01747 *25*; α(L)=0.00311 *4*; α(M)=0.000674 *10* α(N)=0.0001490 *21*; α(O)=2.143×10^{-5} *30*; α(P)=1.002×10^{-6} *14*
406.34 *6*	2.40 *12*	571.44	3/2$^+$	165.12	1/2$^-$,3/2$^-$	[E1]	0.00640 *9*	%Iγ=2.4 *4* α(K)=0.00549 *8*; α(L)=0.000721 *10*; α(M)=0.0001517 *21* α(N)=3.38×10^{-5} *5*; α(O)=5.08×10^{-6} *7*; α(P)=3.15×10^{-7} *4*
408.92[b] *15*	0.60[b] *9*	517.43	(3/2,5/2,7/2)	108.54	7/2$^-$	[D,E2]	0.019 *11*	%Iγ=0.60 *13* E_γ: other: 409.70 *9* for the unresolved doublet in β^- decay (1977Pi06). I_γ: combined intensity of the doublet=1.1 *1* in β^- decay.
410.29[b] *3*	0.50[b] *7*	548.70	3/2$^-$	138.44	5/2$^-$	[M1+E2]	0.025 *5*	%Iγ=0.50 *10* α(K)=0.021 *5*; α(L)=0.00321 *27*; α(M)=0.00069 *5* α(N)=0.000153 *12*; α(O)=2.27×10^{-5} *24*; α(P)=1.30×10^{-6} *35* E_γ: other: 409.70 *9* for the unresolved doublet in β^- decay (1977Pi06). I_γ: combined intensity of the doublet=1.1 *1* in β^- decay.
[x]413.56[#] *37*	0.18 *9*							%Iγ=0.18 *9*

$^{149}_{60}$Nd$_{89}$-10

γ(^{149}Nd) (continued)

E_γ[†]	I_γ[†ch]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[i]	Comments
432.96 *7*	2.40 *12*	571.44	3/2$^+$	138.44	5/2$^-$	[E1]	0.00550 *8*	%Iγ=2.4 *4* α(K)=0.00472 *7*; α(L)=0.000618 *9*; α(M)=0.0001301 *18* α(N)=2.90×10^{-5} *4*; α(O)=4.36×10^{-6} *6*; α(P)=2.72×10^{-7} *4*
450.40[#f] *20*	0.56 *9*	709.45	(3/2,5/2$^-$)	258.33	3/2$^-$	[D,E2]	0.014 *10*	%Iγ=0.56 *12* Eγ: poor fit, level-energy difference=451.24.
459.9[#] *3*	0.95 *20*	459.53	(3/2$^-$,5/2$^-$)	0.0	5/2$^-$	[M1+E2]	0.019 *4*	%Iγ=0.95 *25* α(K)=0.016 *4*; α(L)=0.00232 *27*; α(M)=0.00050 *5* α(N)=0.000110 *12*; α(O)=1.65×10^{-5} *22*; α(P)=9.7×10^{-7} *26*
^{x}465.65[#] *25*	0.36 *13*							%Iγ=0.36 *14*
474.57[#] *6*	2.80 *17*	474.63	(5/2$^+$,7/2)	0.0	5/2$^-$	[D,E2]	0.013 *8*	%Iγ=2.8 *5*
494.90 *8*	0.88 *13*	603.44		108.54	7/2$^-$	[D,E2]	0.011 *7*	%Iγ=0.88 *19* Eγ,Iγ: from 2010Ru09. This γ was reported in 1977Pi06 with Eγ=494.62 *12*, Iγ=0.74 *5* (1977Pi06), but was unplaced.
517.43[#] *6*	4.80 *20*	517.43	(3/2,5/2,7/2)	0.0	5/2$^-$	[D,E2]	0.010 *6*	%Iγ=4.8 *7*
528.91[e] *10*	0.31 *7*	814.35	1/2$^+$	285.48	1/2$^-$	[E1]	0.00347 *5*	%Iγ=0.31 *8* α(K)=0.00298 *4*; α(L)=0.000387 *5*; α(M)=8.14×10^{-5} *11* α(N)=1.816×10^{-5} *25*; α(O)=2.74×10^{-6} *4*; α(P)=1.734×10^{-7} *24*
^{x}530.59[#] *25*	0.85 *17*							%Iγ=0.85 *21*
540.1[d] *3*	0.55[d] *9*	705.01	(3/2,5/2)	165.12	1/2$^-$,3/2$^-$	[D,E2]		%Iγ=0.55 *12* Eγ: uncertainty assigned by the evaluators.
545.3[dk] *5*	0.08[d] *3*	709.45	(3/2,5/2$^-$)	165.12	1/2$^-$,3/2$^-$	[D,E2]	0.009 *6*	%Iγ=0.08 *3*
566.8[#] *3*	0.47 *8*	705.01	(3/2,5/2)	138.44	5/2$^-$	[D,E2]		%Iγ=0.47 *11*
571.13[#] *10*	0.80 *9*	709.45	(3/2,5/2$^-$)	138.44	5/2$^-$	[D,E2]	0.008 *5*	%Iγ=0.80 *15*
576.39[#] *15*	0.45 *10*	741.51	3/2$^+$	165.12	1/2$^-$,3/2$^-$	[E1]	0.00287 *4*	%Iγ=0.45 *12* α(K)=0.002463 *35*; α(L)=0.000319 *4*; α(M)=6.70×10^{-5} *9* α(N)=1.496×10^{-5} *21*; α(O)=2.258×10^{-6} *32*; α(P)=1.438×10^{-7} *20*
592.1[d] *2*	0.16[d] *4*	862.81	(7/2)$^+$	270.69	(9/2$^+$)	[M1+E2]	0.0098 *22*	%Iγ=0.16 *5* α(K)=0.0083 *20*; α(L)=0.00117 *19*; α(M)=0.00025 *4* α(N)=5.6×10^{-5} *9*; α(O)=8.4×10^{-6} *15*; α(P)=5.1×10^{-7} *14*
604.07[#] *14*	1.20 *6*	920.66	(3/2,5/2,7/2$^-$)	316.25	(5/2$^-$,7/2$^-$)	[D,E2]	0.007 *4*	%Iγ=1.20 *19*
622.97[#] *10*	1.80 *14*	881.36	3/2$^+$	258.33	3/2$^-$	[E1]	2.42×10^{-3} *3*	%Iγ=1.80 *30* α(K)=0.002081 *29*; α(L)=0.000268 *4*; α(M)=5.64×10^{-5} *8* α(N)=1.260×10^{-5} *18*; α(O)=1.904×10^{-6} *27*; α(P)=1.218×10^{-7} *17*

$^{149}_{60}$Nd$_{89}$-11

γ(^{149}Nd) (continued)

E_γ[†]	I_γ[†ch]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[i]	Comments
[x]632.11[#] *31*	0.30 *9*							%Iγ=0.30 *10*
642.03[d] *8*	0.30[d] *7*	862.81	(7/2)$^+$	220.73	9/2$^-$	[E1]	2.27×10^{-3} *3*	%Iγ=0.30 *8* α(K)=0.001952 *27*; α(L)=0.0002514 *35*; α(M)=5.28×10^{-5} *7* α(N)=1.180×10^{-5} *17*; α(O)=1.784×10^{-6} *25*; α(P)=1.144×10^{-7} *16*
649.22[#] *20*	0.20 *10*	814.35	1/2$^+$	165.12	1/2$^-$,3/2$^-$	[E1]	2.22×10^{-3} *3*	%Iγ=0.20 *10* α(K)=0.001906 *27*; α(L)=0.0002454 *34*; α(M)=5.16×10^{-5} *7* α(N)=1.152×10^{-5} *16*; α(O)=1.741×10^{-6} *24*; α(P)=1.117×10^{-7} *16*
662.45[#] *9*	1.80 *13*	920.66	(3/2,5/2,7/2$^-$)	258.33	3/2$^-$	[D,E2]	0.0056 *35*	%Iγ=1.80 *30*
675.6[#] *3*	0.60 *10*	814.35	1/2$^+$	138.44	5/2$^-$	[M2]	0.02463 *35*	%Iγ=0.60 *13* α(K)=0.02080 *29*; α(L)=0.00302 *4*; α(M)=0.000645 *9* α(N)=0.0001445 *20*; α(O)=2.194×10^{-5} *31*; α(P)=1.412×10^{-6} *20* Mult.: M2 required from ΔJ^π. Placement is unlikely.
716.47[#] *27*	0.35 *17*	881.36	3/2$^+$	165.12	1/2$^-$,3/2$^-$	[E1]	1.80×10^{-3} *3*	%Iγ=0.35 *18* α(K)=0.001552 *22*; α(L)=0.0001989 *28*; α(M)=4.18×10^{-5} *6* α(N)=9.34×10^{-6} *13*; α(O)=1.413×10^{-6} *20*; α(P)=9.12×10^{-8} *13*
[x]721.63[#] *31*	0.53 *13*							%Iγ=0.53 *15*
724.7 *2*	0.19 *5*	862.81	(7/2)$^+$	138.44	5/2$^-$	[E1]	1.76×10^{-3} *3*	%Iγ=0.19 *6* α(K)=0.001516 *21*; α(L)=0.0001942 *27*; α(M)=4.08×10^{-5} *6* α(N)=9.11×10^{-6} *13*; α(O)=1.380×10^{-6} *19*; α(P)=8.91×10^{-8} *12* E_γ,I_γ: from 2010Ru09. This γ was reported in 1977Pi06 with Eγ=724.30 *30*, Iγ=0.80 *11* (1977Pi06), but was unplaced.
742.94[#] *10*	1.40 *14*	881.36	3/2$^+$	138.44	5/2$^-$	[E1]	1.67×10^{-3} *2*	%Iγ=1.40 *25* α(K)=0.001441 *20*; α(L)=0.0001844 *26*; α(M)=3.87×10^{-5} *5* α(N)=8.65×10^{-6} *12*; α(O)=1.311×10^{-6} *18*; α(P)=8.48×10^{-8} *12*
755.81[#] *15*	0.85 *12*	920.66	(3/2,5/2,7/2$^-$)	165.12	1/2$^-$,3/2$^-$	[D,E2]	0.0041 *25*	%Iγ=0.85 *18*
[x]766.86[#] *28*	0.40 *20*							%Iγ=0.40 *21*
781.99[#] *15*	1.3 *2*	920.66	(3/2,5/2,7/2$^-$)	138.44	5/2$^-$	[D,E2]	0.0038 *23*	%Iγ=1.30 *28*
[x]797.35[#] *30*	0.88 *15*							%Iγ=0.88 *20*
874.11[k] *26*	0.80 *8*	1012.6?		138.44	5/2$^-$	[D,E2]	0.003 *2*	%Iγ=0.80 *14* Placement proposed by 2010Ru09. Eγ=874.8 in 2010Ru09. Placement considered uncertain by the evaluators.

From ENSDF

$^{149}_{60}$Nd$_{89}$-12

γ(^{149}Nd) (continued)

[†] From 1977Pi06, unless otherwise stated. According to 1977Pi06, uncertainties quoted for the intensities in their Table 1 do not take into account 15% uncertainty resulting from the absolute intensity calibration procedure.

[‡] Placed by evaluators.

[#] From 1977Pi06 only.

[@] Corrected for weak contribution from ^{142}Ba β^-.

[&] Corrected for weak contribution from ^{149}Nd β^-.

[a] $\gamma\gamma$ data indicate an unresolved doublet. Intensity is split between two locations. Uncertainty of 10-15% is assigned by the evaluators based on the uncertainty for the combined intensity of the unresolved doublet in β^- decay.

[b] $\gamma\gamma$-coin data indicate a doublet (1977Pi06). Energy is from curved crystal data in (n,γ) (1976Pi04). Split intensity is taken from 1977Pi06, probably from their $\gamma\gamma$-coin data.

[c] 1977Pi06 establish the absolute intensity of 138.46γ as 11.0 *17* per 100 disintegrations, in agreement with 13 *5* from 1967Va14.

[d] γ from 2010Ru09, energy and intensity data obtained through an e-mail reply of June 8, 2010 from the authors.

[e] γ taken by 2010Ru09 from the Adopted Gammas from the 2004 version of the A=149 ENSDF database; $\gamma\gamma$-coin evidence is from 2010Ru09. Intensity is based on branching ratios in the Adopted Gammas.

[f] Uncertainty doubled in the least-squares fit procedure, due to its poor fit in the level scheme.

[g] Dominant M1 expected from RUL=300 for E2.

[h] For absolute intensity per 100 decays, multiply by 1.00 *15*.

[i] 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.

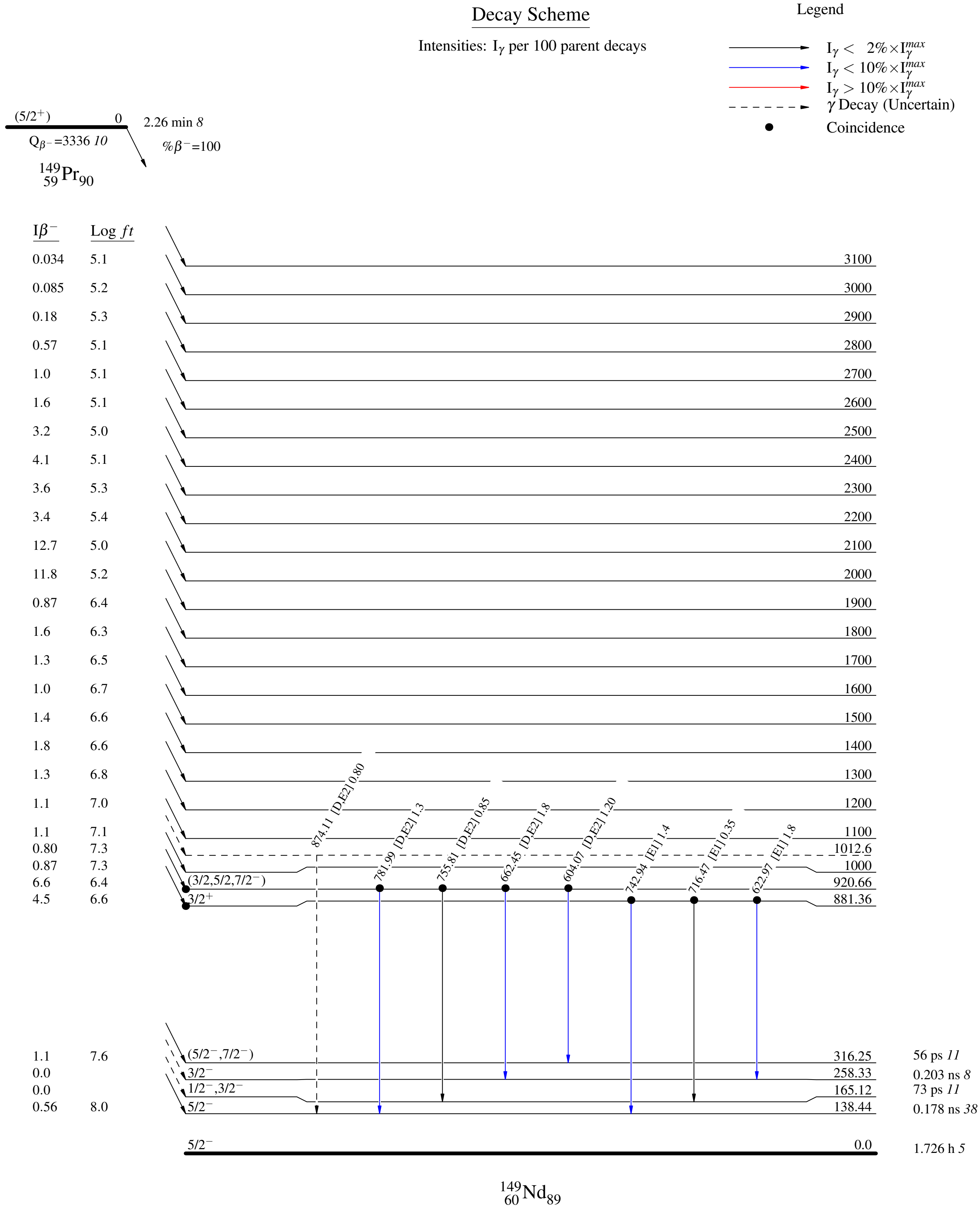
[j] Multiply placed with intensity suitably divided.

[k] Placement of transition in the level scheme is uncertain.

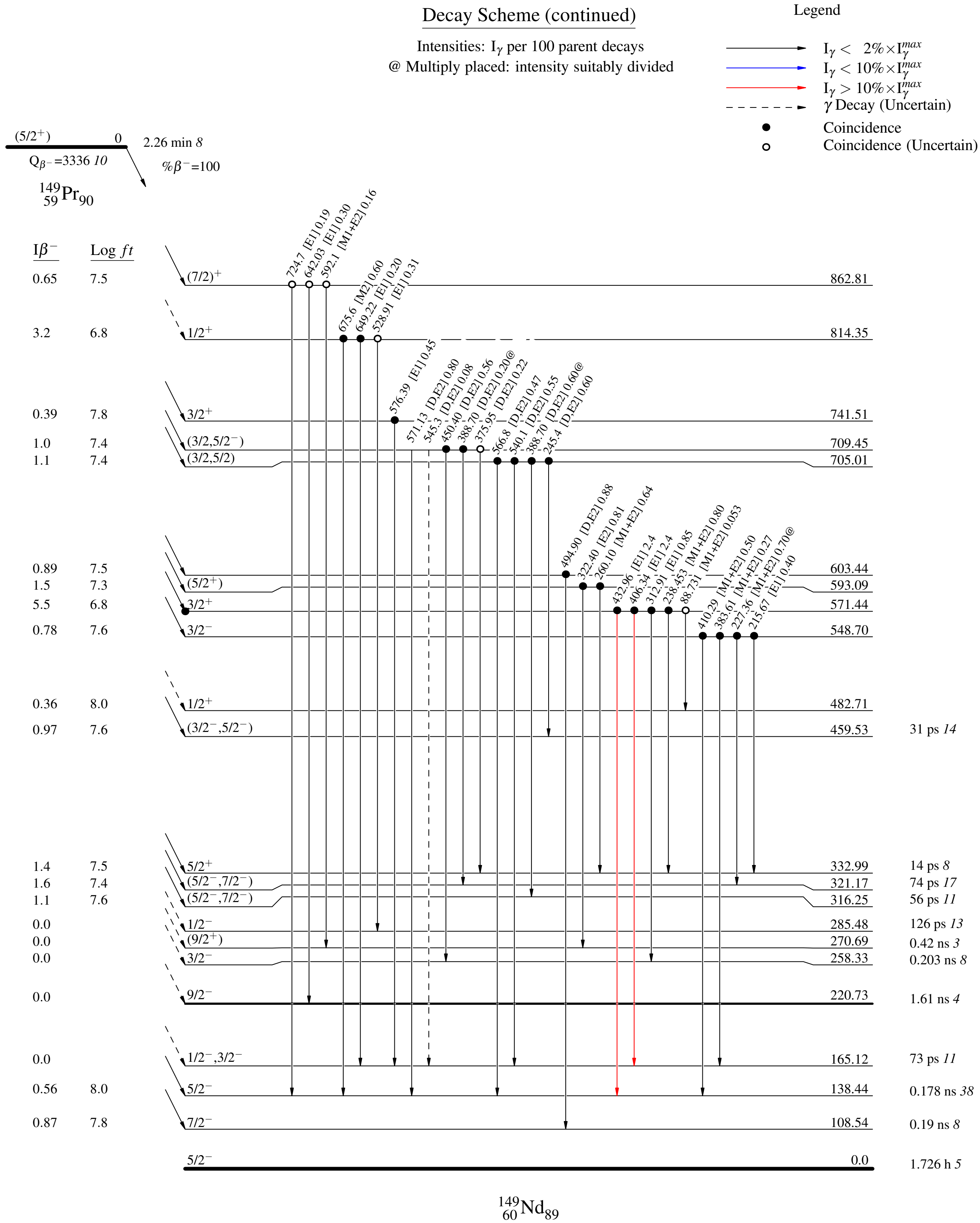
[x] γ ray not placed in level scheme.

$^{149}_{60}$Nd$_{89}$-13

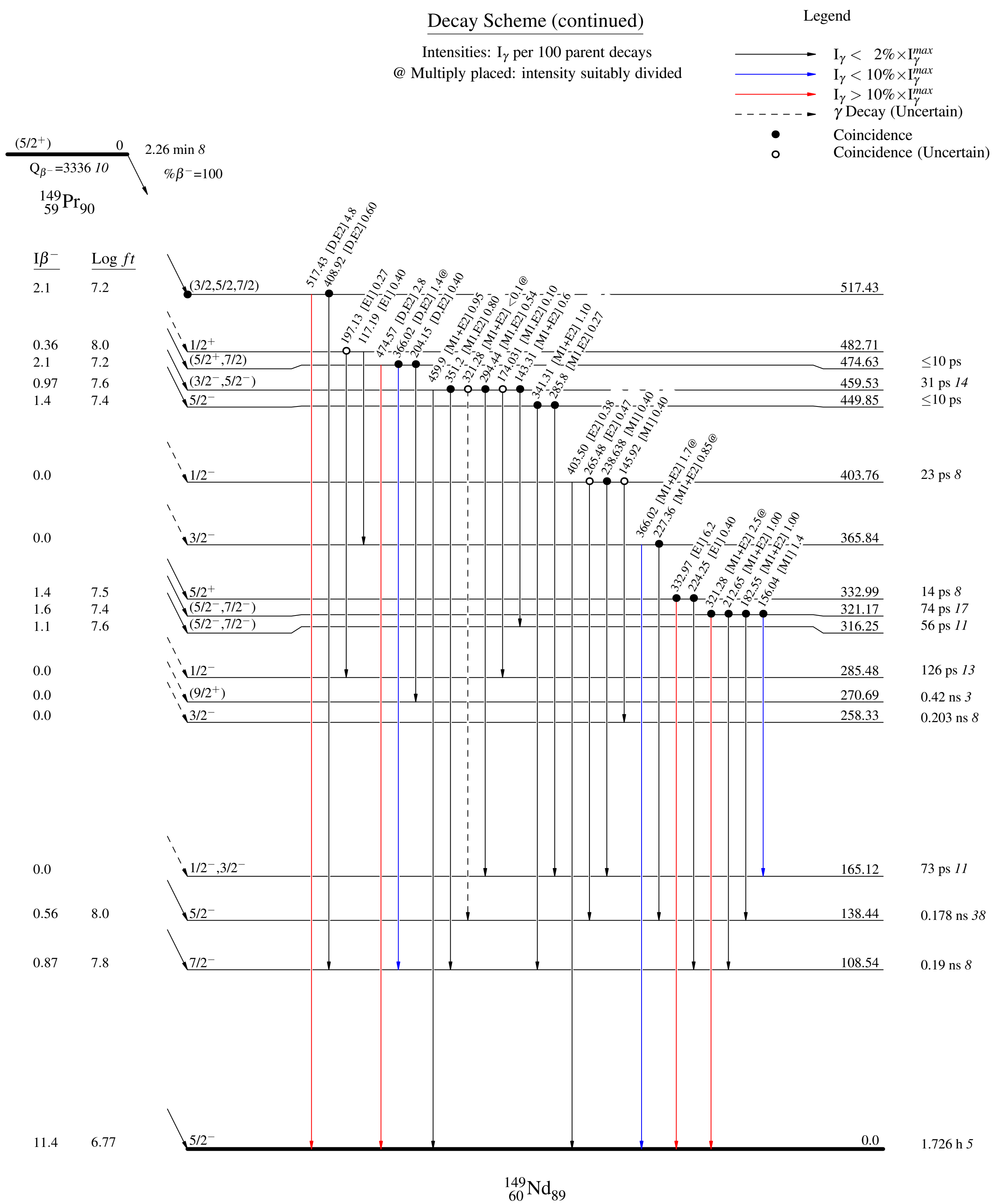
$^{149}Pr\ \beta^-$ decay (2.26 min) 1977Pi06,2010Ru09,1997Gr09



^{149}Pr β^- decay (2.26 min) 1977Pi06,2010Ru09,1997Gr09



^{149}Pr β^- decay (2.26 min) 1977Pi06,2010Ru09,1997Gr09



^{149}Pr β^- decay (2.26 min) 1977Pi06,2010Ru09,1997Gr09