^{136}Nd ε decay 1981AbZV,1975Br16,1968Zh04

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 152, 331 (2018)	1-Apr-2018

Parent: ^{136}Nd: E=0.0; $J^\pi=0^+$; $T_{1/2}$=50.65 min *33*; Q(ε)=2141 *16*; %ε+%$β^+$ decay=100.0

1968Zh04: Measured Eγ, Iγ, $β^+$'s and ce's.

1975Br16: ^{136}Nd activity from ^{136}Ce(^{3}He,3n) reaction with E(^{3}He)=27 MeV followed by chemical separation. Measured Eγ, Iγ, γγ-coincidences, Xγ(t), γγ(t), Ece, Ice using four Ge detectors and Eβ, βγ coincidences using two NaI scintillators and an anthracene scintillator.

1981AbZV: Measured Eγ, Iγ, Ece, Ice, and ceγ-coincidences.

Others: 1987GrZT, 1980ZhZZ, 1976AlZK, 1973Bu11, 1968BaZW.

The data from 1975Br16 and 1981AbZV are consistent, with 1981AbZV providing a more extensive set of γ-ray and conversion electron measurements. For that reason, the results of 1981AbZV are mainly adopted here, except where noted.

^{136}Pr Levels

E(level)†	J^π‡	$T_{1/2}$	Comments
0.0#	2^+	13.1 min *1*	%ε+%$β^+$=100 $T_{1/2}$: from the Adopted Levels.
40.19@ *7*	$1^+,2^+$	9.25 ns *20*	$T_{1/2}$: weighted average of 9.4 ns *2* (1975Br16, (109γ)(40γ)(t)) and 9.1 ns *2* (1976AlZK).
130.53 *12*	$(3)^+$		
140.69 *12*	$0^+,1^+$		
149.11# *8*	1^+	<0.8 ns	$T_{1/2}$: from (K-x ray)(109γ)(t) (1975Br16). Other: <0.2 ns (1976AlZK).
184.51 *11*	1^+		
334.69 *17*	(1^+)		
476.63& *15*	1^+		
574.82& *9*	1^+		
672.79 *22*	$(1)^+$		
793.3 *3*	$0^+,1^+$		
940.10a *21*	$(1)^+$		
972.3a *4*	$(1)^+$		
1004.8 *4*	$(0^+,1^+)$		
1062.6 *3*	$(0,1)^+$		
1171.9 *3*	(1^+)		
1183.9 *5*	0,1		
1488.8 *3*	$(0,1)^+$		

† From a least-squares fit to Eγ, by evaluator.

‡ From the Adopted Levels.

Configuration=((π 3/2[411])(ν 1/2[400])) (1975Br16).

@ Configuration=((π 5/2[413])(ν 1/2[400])) (1975Br16).

& Weak coupling of 1^+ particle states with lowest ^{136}Ce 2^+ vibrational state (1975Br16).

a Weak coupling of 1^+ particle states with second ^{136}Ce 2^+ vibrational state (1975Br16).

^{136}Nd ε decay 1981AbZV,1975Br16,1968Zh04 (continued)

ε,β+ radiations

E(decay)	E(level)	Iβ+ ‡	Iε‡	Log *ft*†	I(ε+β+)‡	Comments
(652 *16*)	1488.8		0.68 *11*	6.01 *8*	0.68 *11*	εK=0.8354 *5*; εL=0.1279 *4*; εM+=0.03671 *11*
(957 *16*)	1183.9		0.45 *11*	6.54 *11*	0.45 *11*	εK=0.8405 *2*; εL=0.12409 *14*; εM+=0.03542 *5*
(969 *16*)	1171.9		0.83 *12*	6.28 *7*	0.83 *12*	εK=0.8406 *2*; εL=0.12399 *14*; εM+=0.03539 *5*
(1078 *16*)	1062.6		0.54 *11*	6.56 *9*	0.54 *11*	εK=0.8417 *2*; εL=0.1232 *1*; εM+=0.03512 *4*
(1136 *16*)	1004.8		0.24 *7*	6.96 *13*	0.24 *7*	εK=0.8422 *2*; εL=0.1228 *1*; εM+=0.03500 *4*
(1169 *16*)	972.3		0.77 *15*	6.48 *9*	0.77 *15*	εK=0.8424 *2*; εL=0.12264 *9*; εM+=0.03494 *3*
(1201 *16*)	940.10		1.88 *14*	6.12 *4*	1.88 *14*	εK=0.8426 *1*; εL=0.12247 *9*; εM+=0.03488 *3*
(1348 *16*)	793.3		0.86 *12*	6.56 *7*	0.86 *12*	εK=0.8429; εL=0.12170 *9*; εM+=0.03463 *3*
(1468 *16*)	672.79	0.0019 *5*	0.65 *14*	6.76 *10*	0.65 *14*	av Eβ=211.6 *71*; εK=0.8417 *3*; εL=0.1210 *1*; εM+=0.03440 *4*
(1566 *16*)	574.82	0.078 *12*	12.2 *12*	5.54 *5*	12.3 *12*	av Eβ=254.6 *71*; εK=0.8392 *6*; εL=0.12026 *14*; εM+=0.03418 *5*
(1664 *16*)	476.63	0.022 *3*	1.86 *21*	6.42 *5*	1.88 *21*	av Eβ=297.6 *70*; εK=0.8349 *9*; εL=0.11931 *18*; εM+=0.03390 *6*
(1806# *16*)	334.69	0.004 *3*	0.18 *14*	7.5 *4*	0.18 *14*	av Eβ=359.7 *70*; εK=0.8247 *15*; εL=0.1175 *3*; εM+=0.03335 *8*
(1956 *16*)	184.51	0.04 *2*	0.8 *4*	6.95 *22*	0.8 *4*	av Eβ=425.5 *71*; εK=0.8079 *22*; εL=0.1147 *4*; εM+=0.03256 *10*
(1992 *16*)	149.11	3.76 *22*	70.4 *11*	4.996 *11*	74.2 *11*	av Eβ=441.1 *71*; εK=0.8030 *24*; εL=0.1139 *4*; εM+=0.03234 *11* E(decay): other: 2062 *25* (1975Br16, from εK/β+=13.2 *9* measured using K x ray/γ± coin with 109γ).
(2000 *16*)	140.69	0.099 *22*	1.8 *4*	6.59 *10*	1.9 *4*	av Eβ=444.8 *71*; εK=0.8018 *24*; εL=0.1138 *4*; εM+=0.03228 *11*
(2010 *16*)	130.53	0.024 *8*	0.43 *14*	7.22 *15*	0.45 *15*	av Eβ=449.3 *71*; εK=0.8003 *25*; εL=0.1135 *4*; εM+=0.03222 *11* Log *ft*: too small for a ΔJ=3 transition, however, weak branch could be explained by incompleteness of the decay scheme.
(2101# *16*)	40.19	<0.6	<7	>6.0	<8	av Eβ=489.0 *71*; εK=0.786 *3*; εL=0.1113 *5*; εM+=0.03157 *13*

† These values differ slightly from those derived by 1981AbZV who assumed Q(ε)=2170 *50* and considerably from 1975Br16 whose decay scheme was less complete.

‡ Absolute intensity per 100 decays.

Existence of this branch is questionable.

^{136}Nd ε decay 1981AbZV,1975Br16,1968Zh04 (continued)

γ(^{136}Pr)

Iγ normalization: from ΣI(γ+ce) (to g.s.)=100, assuming no direct feeding of g.s. ($\Delta J^\pi=2^+$).
α(exp), ce′s normalized assuming α(K)(109γ)=0.883.

E_γ	I_γ[c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[‡]	α[d]	Comments
40.2 *1*	60 *5*	40.19	$1^+,2^+$	0.0	2^+	M1+E2	0.040 *7*	2.85 *6*	α(L)exp=2.33 *47* (1981AbZV); α(L)exp=2.73 *20* (1975Br16) α(L)=2.25 *5*; α(M)=0.476 *11*; α(N)=0.1062 *23*; α(O)=0.0170 *4*; α(P)=0.001197 *19* ce(L)=140 *14*; ce(M)=29.6 *30*; ce(N)=7.7 *8* (1981AbZV) L1:L2:L3=100:11 *1*:4.3 *6*; α(L1)=2.00; α(L2)=0.207 *10*; α(L3)=0.085 *13* (1968Zh04)
[x]63.0[&] *2*									ce(L)=0.43 *8*; ce(M)=0.15 *3* (1981AbZV)
100.54 *11*	4.4 *4*	140.69	$0^+,1^+$	40.19	$1^+,2^+$	M1		1.275	α(K)exp=0.89 *18*; α(L)exp=0.11 *4* (1981AbZV) α(K)=1.086 *16*; α(L)=0.1498 *22*; α(M)=0.0316 *5*; α(N)=0.00706 *11*; α(O)=0.001136 *17* α(P)=8.34×10^{-5} *12* ce(K)=3.9 *4*; ce(L)=0.50 *10*; ce(M)=0.14 *5* (1981AbZV)
108.90 *10*	100	149.11	1^+	40.19	$1^+,2^+$	M1+E2	0.21 *3*	1.039 *17*	α(L)exp=0.134 *13* (1981AbZV) α(K)=0.868 *13*; α(L)=0.135 *5*; α(M)=0.0287 *11*; α(N)=0.00638 *24*; α(O)=0.00101 *4* α(P)=6.57×10^{-5} *10* ce(K)=88.3 *14*; ce(L)=13.4 *13*; ce(M)=3.3 *4*; ce(N)=0.17 *14* (1981AbZV) L1:L2:L3=100:13.2 *14*:6.7 *7* (1968Zh04)
130.54[#] *13*	1.70 *17*	130.53	$(3)^+$	0.0	2^+	M1+E2	2.7 *18*	0.80 *10*	α(K)exp=0.41 *10*; α(L)exp=0.21 *6* (1981AbZV) α(K)=0.541 *14*; α(L)=0.20 *7*; α(M)=0.045 *15*; α(N)=0.010 *4*; α(O)=0.0014 *5*; α(P)=3.1×10^{-5} *5* ce(K)=0.70 *10*; ce(L)=0.35 *7*; ce(M)+=0.19 *6* (1981AbZV)
[x]139.3[&] *5*	0.65 *15*								
144.28 *15*	4.0 *6*	184.51	1^+	40.19	$1^+,2^+$	M1(+E2)[@]	0.2 *+4−2*	0.46 *3*	α(L)exp=0.058 *20* (1981AbZV) α(K)=0.391 *6*; α(L)=0.057 *21*; α(M)=0.012 *5*; α(N)=0.0027 *10*; α(O)=0.00043 *14* α(P)=2.97×10^{-5} *18* ce(L)=0.23 *4* (1981AbZV)
149.1 *1*	22.0 *20*	149.11	1^+	0.0	2^+	M1		0.419	α(K)exp=0.29 *7*; α(L)exp=0.045 *9* (1981AbZV) α(K)=0.357 *5*; α(L)=0.0489 *7*; α(M)=0.01031 *15*; α(N)=0.00231 *4*; α(O)=0.000371 *6* α(P)=2.74×10^{-5} *4* ce(K)=6.3 *9*; ce(L)=1.0 *1*; ce(M)+=0.20 *3* (1981AbZV) K/L=7.3 *12* (1975Br16)
184.5 *2*	1.5 *3*	184.51	1^+	0.0	2^+	M1		0.232	α(L)exp=0.018 *10* (1981AbZV) α(K)=0.198 *3*; α(L)=0.0270 *4*; α(M)=0.00569 *9*;

$^{136}_{59}Pr_{77}$-3

^{136}Nd ε decay 1981AbZV,1975Br16,1968Zh04 (continued)

γ(^{136}Pr) (continued)

E_γ	I_γ[c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[‡]	α[d]	Comments
									α(N)=0.001273 *19*; α(O)=0.000205 *3* α(P)=1.515×10^{-5} *22* ce(L)=0.027 *13* (1981AbZV)
204.3[#] *5*	0.45 *9*	334.69	(1$^+$)	130.53	(3)$^+$	(E2)		0.177 *3*	α(K)exp=0.13 *6* (1981AbZV) α(K)=0.141 *9*; α(L)=0.027 *7*; α(M)=0.0059 *17*; α(N)=0.0013 *4*; α(O)=0.00020 *5* α(P)=9.8×10^{-6} *17* ce(K)=0.060 *15* (1981AbZV) Mult.: α(K)exp allows for M1,E2, transition to (3)$^+$ constrains to E2.
211.6[&][e] *5*	0.50 *15*	1183.9	0,1	972.3	(1)$^+$				
219.5[e] *10*	0.18 *8*	793.3	0$^+$,1$^+$	574.82	1$^+$				
240.4[&] *5*	0.50 *15*	574.82	1$^+$	334.69	(1$^+$)	M1,E2		0.108 *6*	α(K)exp=0.10 *5* (1981AbZV) α(K)=0.088 *9*; α(L)=0.016 *3*; α(M)=0.0034 *7*; α(N)=0.00074 *13*; α(O)=0.000114 *16* α(P)=6.2×10^{-6} *12* ce(K)=0.050 *13* (1981AbZV)
[x]252.7[&] *3*	0.90 *15*					M1+E2	≤1	0.096 *4*	α(K)exp=0.089 *13* (1981AbZV) ce(K)=0.080 *9* (1981AbZV) α(K)=0.081 *5*; α(L)=0.0125 *9*; α(M)=0.00265 *22*; α(N+..)=0.00072 *6*
292.4 *5*	0.65 *15*	476.63	1$^+$	184.51	1$^+$	E2(+M1)[a]	>0.5	0.0548	α(K)exp=0.037 *18* (1981AbZV) α(K)=0.0436 *7*; α(L)=0.00883 *14*; α(M)=0.00192 *3*; α(N)=0.000421 *7*; α(O)=6.33×10^{-5} *10* α(P)=2.83×10^{-6} *5* ce(K)=0.024 *6* (1981AbZV)
294.6 *2*	2.10 *25*	334.69	(1$^+$)	40.19	1$^+$,2$^+$	E2		0.0535	α(K)exp=0.042 *8*; α(L)exp=0.0048 *17* (1981AbZV) α(K)=0.0426 *6*; α(L)=0.00859 *13*; α(M)=0.00187 *3*; α(N)=0.000410 *6*; α(O)=6.16×10^{-5} *9* α(P)=2.77×10^{-6} *4* ce(K)=0.088 *9*; ce(L)=0.010 *2* (1981AbZV) Mult.: from α(K)exp. α(L)exp is low compared to α(L)(M1)=0.0076 and α(L)(E2)=0.0086.
336.0 *3*	1.5 *3*	476.63	1$^+$	140.69	0$^+$,1$^+$	M1[b]		0.0466	α(K)exp=0.048 *16* (1981AbZV) α(K)=0.0399 *6*; α(L)=0.00535 *8*; α(M)=0.001124 *16*; α(N)=0.000251 *4*; α(O)=4.06×10^{-5} *6* α(P)=3.02×10^{-6} *5* ce(K)=0.072 *7* (1981AbZV)
390.3 *2*	2.4 *4*	574.82	1$^+$	184.51	1$^+$	M1,E2		0.027 *5*	α(K)exp=0.025 *7* (1981AbZV) α(K)=0.023 *5*; α(L)=0.00344 *19*; α(M)=0.00073 *3*; α(N)=0.000162 *8*; α(O)=2.56×10^{-5} *19* α(P)=1.7×10^{-6} *4* ce(K)=0.060 *6* (1981AbZV)

$^{136}_{59}Pr_{77}$-4

^{136}Nd ε decay 1981AbZV,1975Br16,1968Zh04 (continued)

γ(^{136}Pr) (continued)

E_γ	I_γ[c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[‡]	α[d]	Comments
425.9[#] *3*	0.60 *10*	1488.8	(0,1)$^+$	1062.6	(0,1)$^+$	E2[a]		0.01762	α(K)exp=0.013 *5* (1981AbZV) α(K)=0.01450 *21*; α(L)=0.00246 *4*; α(M)=0.000528 *8*; α(N)=0.0001166 *17*; α(O)=1.80×10^{-5} *3* α(P)=9.93×10^{-7} *14* ce(K)=0.008 *2* (1981AbZV)
436.5 *4*	0.60 *15*	476.63	1$^+$	40.19	1$^+$,2$^+$	M1,E2		0.020 *4*	α(K)exp=0.022 *9* (1981AbZV) α(K)=0.017 *4*; α(L)=0.00249 *22*; α(M)=0.00053 *4*; α(N)=0.000117 *10*; α(O)=1.86×10^{-5} *20* α(P)=1.2×10^{-6} *3* ce(K)=0.013 *2* (1981AbZV)
476.7 *2*	4.0 *4*	476.63	1$^+$	0.0	2$^+$	M1+E2	<0.9	0.016 *3*	α(K)exp=0.014 *3*; α(L)exp=0.0023 *8* (1981AbZV) α(K)=0.014 *3*; α(L)=0.00197 *20*; α(M)=0.00042 *4*; α(N)=9.3×10^{-5} *9*; α(O)=1.47×10^{-5} *17* α(P)=1.01×10^{-6} *22* ce(K)=0.056 *5*; ce(L)=0.009 *2* (1981AbZV)
488.6 *5*	0.55 *15*	672.79	(1)$^+$	184.51	1$^+$	M1,E2		0.015 *3*	α(K)exp=0.011 *5* (1981AbZV) α(K)=0.013 *3*; α(L)=0.00182 *22*; α(M)=0.00038 *5*; α(N)=8.6×10^{-5} *10*; α(O)=1.36×10^{-5} *18* α(P)=9.2×10^{-7} *24* ce(K)=0.062 *18* (1981AbZV)
498.7[&] *5*	0.80 *25*	1171.9	(1$^+$)	672.79	(1)$^+$				
523.6 *4*	0.55 *15*	672.79	(1)$^+$	149.11	1$^+$	M1,E2		0.012 *3*	α(K)exp=0.015 *7* (1981AbZV) α(K)=0.0106 *23*; α(L)=0.00150 *20*; α(M)=0.00032 *4*; α(N)=7.1×10^{-5} *9*; α(O)=1.13×10^{-5} *17* α(P)=7.7×10^{-7} *20* ce(K)=0.0082 *21* (1981AbZV)
[x]525.9[e]	≤0.15								
528.3[&] *5*	0.25 *8*	1004.8	(0$^+$,1$^+$)	476.63	1$^+$				
534.9 *4*	2.3 *4*	574.82	1$^+$	40.19	1$^+$,2$^+$	E2[a]		0.00941	α(K)exp=0.0074 *24* (1981AbZV) α(K)=0.00785 *11*; α(L)=0.001229 *18*; α(M)=0.000262 *4*; α(N)=5.81×10^{-5} *9*; α(O)=9.06×10^{-6} *13* α(P)=5.49×10^{-7} *8* ce(K)=0.017 *3* (1981AbZV)
574.8 *1*	33.0 *30*	574.82	1$^+$	0.0	2$^+$	M1(+E2)	<0.6	0.00992 *1*	α(K)exp=0.010 *2*; α(L)exp=0.0013 *3* (1981AbZV) α(K)=0.0084 *19*; α(L)=0.00117 *18*; α(M)=0.00025 *4*; α(N)=5.5×10^{-5} *8*; α(O)=8.8×10^{-6} *15* α(P)=6.1×10^{-7} *16* ce(K)=0.336 *34*; ce(L)=0.044 *4*; ce(M)+=0.0014 *14* (1981AbZV)
605.7 *4*	1.6 *2*	940.10	(1)$^+$	334.69	(1$^+$)	M1(+E2)	0.5 *+12−5*	0.0097 *17*	α(K)exp=0.0085 *20* (1981AbZV) α(K)=0.0083 *15*; α(L)=0.00112 *15*; α(M)=0.00023 *3*; α(N)=5.2×10^{-5} *7*; α(O)=8.4×10^{-6} *12*

$^{136}_{59}Pr_{77}$-5

^{136}Nd ε decay 1981AbZV,1975Br16,1968Zh04 (continued)

γ(^{136}Pr) (continued)

E_γ	I_γ[c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[‡]	α[d]	Comments
									α(P)=6.2×10^{-7} *13* ce(K)=0.0140 *14* (1981AbZV)
632.4 *5*	0.8 *2*	672.79	(1)$^+$	40.19	1$^+$,2$^+$	E2(+M1)	≥0.7	0.0072 *12*	α(K)exp=0.0048 *24* (1981AbZV) α(K)=0.0061 *10*; α(L)=0.00087 *10*; α(M)=0.000183 *21*; α(N)=4.1×10^{-5} *5*; α(O)=6.5×10^{-6} *8* α(P)=4.5×10^{-7} *9* ce(K)=0.0038 *10* (1981AbZV)
643.9 *4*	1.5 *3*	793.3	0$^+$,1$^+$	149.11	1$^+$	E2(+M1)	>0.7	0.0069 *11*	α(K)exp=0.0052 *17* (1981AbZV) α(K)=0.0059 *10*; α(L)=0.00083 *10*; α(M)=0.000174 *20*; α(N)=3.9×10^{-5} *5*; α(O)=6.2×10^{-6} *8* α(P)=4.3×10^{-7} *8* ce(K)=0.0078 *10* (1981AbZV)
652.9 *5*	1.0 *2*	793.3	0$^+$,1$^+$	140.69	0$^+$,1$^+$	M1(+E2)	≤1.6	0.0076 *11*	α(K)exp=0.0085 *30* (1981AbZV) α(K)=0.0065 *10*; α(L)=0.00088 *10*; α(M)=0.000185 *21*; α(N)=4.1×10^{-5} *5*; α(O)=6.6×10^{-6} *8* α(P)=4.8×10^{-7} *8* ce(K)=0.0085 *13* (1981AbZV)
672.4 *5*	0.9 *2*	672.79	(1)$^+$	0.0	2$^+$	E2(+M1)	≥0.5	0.0064 *12*	α(K)exp=0.0044 *22* (1981AbZV) α(K)=0.0054 *11*; α(L)=0.00076 *11*; α(M)=0.000159 *22*; α(N)=3.6×10^{-5} *5*; α(O)=5.7×10^{-6} *9* α(P)=4.0×10^{-7} *9* ce(K)=0.0040 *12* (1981AbZV)
[x]724.8[&] 755.2 *3*	1.45 *20*	940.10	(1)$^+$	184.51	1$^+$	M1,E2		0.0051 *11*	α(K)exp=0.0041 *14* (1981AbZV) α(K)=0.0043 *10*; α(L)=0.00058 *11*; α(M)=0.000123 *21*; α(N)=2.7×10^{-5} *5*; α(O)=4.4×10^{-6} *8* α(P)=3.2×10^{-7} *8* ce(K)=0.0059 *12* (1981AbZV)
[x]841.3[&] *5*	0.30 *8*								
855.5[&] *5*	0.5 *2*	1004.8	(0$^+$,1$^+$)	149.11	1$^+$	(E2,M1)		0.0038 *8*	α(K)exp≈0.0036 (1981AbZV) α(K)=0.0032 *7*; α(L)=0.00043 *8*; α(M)=9.0×10^{-5} *16*; α(N)=2.0×10^{-5} *4*; α(O)=3.2×10^{-6} *6* α(P)=2.4×10^{-7} *6* ce(K)=0.0018 *9* (1981AbZV)
900.3 *5*	1.1 *2*	940.10	(1)$^+$	40.19	1$^+$,2$^+$	E2,M1		0.0033 *7*	α(K)exp=0.0028 *14* (1981AbZV) α(K)=0.0029 *6*; α(L)=0.00038 *7*; α(M)=8.0×10^{-5} *14*; α(N)=1.8×10^{-5} *4*; α(O)=2.9×10^{-6} *6* α(P)=2.1×10^{-7} *5* ce(K)=0.0030 *12* (1981AbZV)
921.9[&] *5*	0.8 *2*	1062.6	(0,1)$^+$	140.69	0$^+$,1$^+$	E2,M1		0.0032 *7*	α(K)exp=0.0023 *12* (1981AbZV) α(K)=0.0027 *6*; α(L)=0.00036 *7*; α(M)=7.6×10^{-5} *13*;

$^{136}_{59}Pr_{77}$-6

^{136}Nd ε decay 1981AbZV,1975Br16,1968Zh04 (continued)

γ(^{136}Pr) (continued)

E_γ	I_γ[c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[d]	Comments
								α(N)=1.7×10^{-5} *3*; α(O)=2.7×10^{-6} *5* α(P)=2.0×10^{-7} *5* ce(K)=0.0018 *6* (1981AbZV)
940.3 *5*	1.7 *2*	940.10	(1)$^+$	0.0	2$^+$	E2,(M1)	0.0030 *6*	α(K)exp=0.0022 *9* (1981AbZV) α(K)=0.0026 *6*; α(L)=0.00034 *6*; α(M)=7.2×10^{-5} *13*; α(N)=1.6×10^{-5} *3*; α(O)=2.6×10^{-6} *5* α(P)=1.9×10^{-7} *5* ce(K)=0.0037 *12* (1981AbZV)
972.3 *5*	2.9 *4*	972.3	(1)$^+$	0.0	2$^+$	M1,(E2)	0.0028 *6*	α(K)exp=0.0028 *10* (1981AbZV) α(K)=0.0024 *5*; α(L)=0.00032 *6*; α(M)=6.7×10^{-5} *12*; α(N)=1.5×10^{-5} *3*; α(O)=2.4×10^{-6} *5* α(P)=1.8×10^{-7} *4* ce(K)=0.0080 *16* (1981AbZV)
1013.1[&] *5*	0.8 *2*	1488.8	(0,1)$^+$	476.63	1$^+$			ce(K)=0.0007 (1981AbZV)
1021.5[&] *5*	0.85 *20*	1062.6	(0,1)$^+$	40.19	1$^+$,2$^+$			ce(K)=0.0010 *5* (1981AbZV)
1031.5[&] *5*	0.8 *2*	1171.9	(1$^+$)	140.69	0$^+$,1$^+$			α(K)exp=0.0021 *12* (1981AbZV) ce(K)=0.0017 *7* (1981AbZV)
1041.4[&] *6*	1.0 *2*	1171.9	(1$^+$)	130.53	(3)$^+$			α(K)exp=0.0027 *13* (1981AbZV) ce(K)=0.0027 *9* (1981AbZV)
1062.5[&] *6*	0.65 *15*	1062.6	(0,1)$^+$	0.0	2$^+$			ce(K)=0.0008 *4* (1981AbZV)
1184.0[&] *8*	0.9 *3*	1183.9	0,1	0.0	2$^+$			ce(K)=0.0006 *3* (1981AbZV)
1489.0[&] *7*	0.70 *25*	1488.8	(0,1)$^+$	0.0	2$^+$			ce(K)=0.0011 *5* (1981AbZV)

[†] From ce measurements, including α(exp) and L-subshell ratios.
[‡] From α(exp) and L-subshell ratios, δ values deduced using the BrIcc mixing program.
[#] Not placed in decay scheme by 1975Br16.
[@] 1981AbZV assign M1, but from α(L)exp, E2 admixture cannot be excluded.
[&] Not reported by 1975Br16.
[a] 1981AbZV assign E2(+M1) or E2,(M1) but from α(K)exp M1 admixture would be negligible.
[b] 1981AbZV assign M1(+E2) but from α(K)exp E2 admixture would be negligible.
[c] For absolute intensity per 100 decays, multiply by 0.320 *20*.
[d] 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.
[e] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

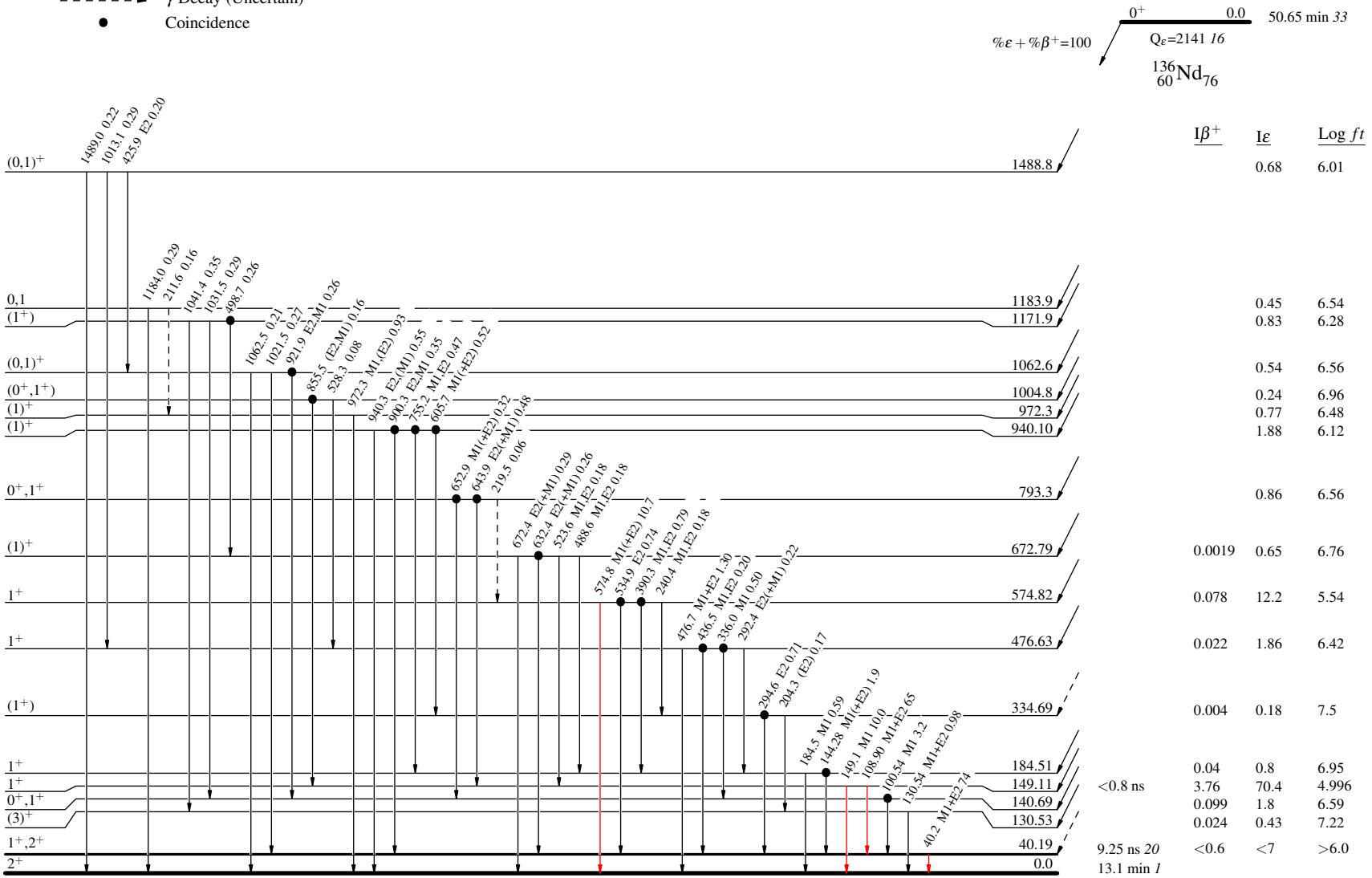
$^{136}_{59}Pr_{77}$-7

^{136}Nd ε decay 1981AbZV,1975Br16,1968Zh04

Decay Scheme

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

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



$^{136}_{59}Pr_{77}$

$^{136}_{59}Pr_{77}$-8