^{146}Nd(n,n′γ) 1983Al12,2004De49

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov, A. Rodionov and G. Shulyak	NDS 136, 163 (2016)	14-Jul-2016

1983Al12,1984Ga31,2004De49: ^{146}Nd(n,n′γ), E=fast; measured Eγ, Iγ, γ(θ), linear pol of γ. ^{146}Nd; deduced levels, J^π, δ.
1994YaZT,1995Di06: ^{146}Nd(n,n′γ), E=1.3 MeV; measured Eγ, Iγ, γ(θ), DSA. ^{146}Nd; deduced levels, J^π, $T_{1/2}$. Van de Graaff, Compton suppressed Ge detector. Authors of 1995Di06 state to have observed 161 levels, 70 of which are new.

^{146}Nd Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[#]	Comments
0.0	0^+		
453.87 *6*	2^+		
1043.19 *9*	4^+		
1189.43 *9*	3^-	0.62 ps *+90−24*	J^π: 3^+ in 1995Di06.
1376.54 *8*	1^-		
1470.40 *8*	2^+		
1517.79 *14*	5^-		
1602.68 *12*	0^+		
1745.00 *11*	4^+		
1777.18 *12*	3^+		
1787.11 *11*	2^+		
1905.43 *11*	2^+		
1918.89 *10*	4^+		
1977.77 *9*	2^+		
1989.25 *12*	4^+		
2045.40 *22*	4^-,5		E(level): 2191.8 keV level is introduced as tentative in 1983Al12 to place 1002γ in the decay scheme. 2191.8 keV level is not seen in other datasets and not adopted.
2072.56 *13*	3^-		
2095.95 *16*	4^+		
2119.50 *15*	2^+		
2143.17 *18*	2^+		
2148.89 *16*	$(1,2^+)$		
2167.90 *14*	3^-		E(level): 2314.2 keV level is introduced as tentative in 1983Al12 to place 1124γ in the decay scheme. 2314.2 keV level is not seen in other sets.
2197.38 *21*	2^+		
2208.34 *22*	2^+		
2219.93 *14*	3^+		
2225.74 *14*	3^+,4^+		
2232.3 *3*	3^-		
2265.89 *19*	2^+		
2286.37 *13*	2^+		
2335.69 *21*	3^-		
2355.84 *17*	1^+		
2356.80 *22*	4^+		E(level): the level seen in (n,γ) E=th and (n,γ) E=0.2-0.5 keV.
2434.9 *3*	4^+		
2436.59 *18*	2^+		
2457.11 *21*	2^+		
2469.50 *22*	2^+,5^+,$(3^+,4^+)$		
2491.09 *21*	2^+,3^+	0.18 ps *+6−4*	
2516.05 *2*	2^-		E(level): the level seen in (n,γ) E=th, (n,γ) E=0.2-0.5 keV and (t,p).
2553.0 *4*	2^+		J^π: 4^+ suggested in (n,n′γ) by 1994YaZT.
2561.69 *21*	3^+		
2610.8 *4*	0^+		
2682.0 *10*	1^-	0.038 ps *6*	E(level): from 1995Di06.
2756.8 *3*	1^-	<6 fs	

Continued on next page (footnotes at end of table)

^{146}Nd(n,n′γ) 1983Al12,2004De49 (continued)

^{146}Nd Levels (continued)

E(level)[†]	Jπ[‡]
2777.2 *5*	1,2$^+$
2855.3 *3*	2$^+$
2885.6 *5*	(4$^+$)
2905.6 *5*	3$^+$,4$^+$
2913.52 *17*	3
3178.70 *20*	3$^+$,(5$^+$)

[†] From a least-squares fit to Eγ′s; normalized χ^2=1.6.
[‡] From 'Adopted Levels'.
[#] From DSAM (1995Di06).

γ(^{146}Nd)

Polarization pol=(1−NR)/(N−R), where count ratio N=$N_{90°}/N_{0°}$, R is sensitivity to linear polarization of polarimeter as a function of energy (1984Ga31).

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	δ ‡	α @	Comments
248.8 *2*	0.25 *4*	2457.11	2^+	2208.34	2^+				
314.4 *2*	0.26 *4*	2219.93	3^+	1905.43	2^+				
453.9 *1*	100.0 *6*	453.87	2^+	0.0	0^+	E2		0.01534	α(K)=0.01262 *18*; α(L)=0.00214 *3*; α(M)=0.000462 *7* α(N)=0.0001023 *15*; α(O)=1.484×10^{-5} *21*; α(P)=7.33×10^{-7} *11* Mult.: from A_2=+0.231 *24*, A_4=−0.048 *30* (1983Al12); pol=2.1 *2* (1984Ga31).
474.6 *1*	4.90 *14*	1517.79	5^-	1043.19	4^+	E1+(M2)	+0.03 *2*	0.00450 *12*	α(K)=0.00386 *11*; α(L)=0.000505 *15*; α(M)=0.000106 *4* α(N)=2.37×10^{-5} *8*; α(O)=3.57×10^{-6} *11*; α(P)=2.24×10^{-7} *7* Mult.: from A_2=+0.21 *3*, A_4=+0.03 *4*; pol=2.3 *4* (1984Ga31).
555.5 *1*	2.25 *8*	1745.00	4^+	1189.43	3^-	E1+(M2)	−0.02 *4*	0.00311 *11*	α(K)=0.00267 *9*; α(L)=0.000347 *14*; α(M)=7.3×10^{-5} *3* α(N)=1.63×10^{-5} *7*; α(O)=2.45×10^{-6} *10*; α(P)=1.56×10^{-7} *6* Mult.: from A_2=−0.25 *6*, A_4=0.0; pol=1.66 *25* (1983Al12, 1984Ga31).
589.3 *1*	20.3 *4*	1043.19	4^+	453.87	2^+	E2		0.00766	α(K)=0.00640 *9*; α(L)=0.000991 *14*; α(M)=0.000212 *3* α(N)=4.72×10^{-5} *7*; α(O)=6.95×10^{-6} *10*; α(P)=3.80×10^{-7} *6* Mult.: from A_2=+0.310 *22*, A_4=−0.047 *25* (1983Al12); pol=3.4 *7* (1984Ga31).
601.4 *4*	3.9 *5*	1977.77	2^+	1376.54	1^-				
657.6 *4*		2434.9	4^+	1777.18	3^+	M1+E2	+0.61 *10*	0.0083 *3*	α(K)=0.00711 *23*; α(L)=0.000965 *25*; α(M)=0.000204 *5* α(N)=4.57×10^{-5} *12*; α(O)=6.93×10^{-6} *19*; α(P)=4.45×10^{-7} *15* E_γ,I_γ: missed in table 1, but Eγ quoted in table 2 (1983Al12). Mult.: from A_2=+0.458 *62*, A_4=+0.213 *92* (1983Al12).
701.7 *2*	1.75 *15*	1745.00	4^+	1043.19	4^+	M1+E2	−0.23 *10*	0.00776 *18*	α(K)=0.00665 *16*; α(L)=0.000881 *18*; α(M)=0.000186 *4* α(N)=4.17×10^{-5} *9*; α(O)=6.35×10^{-6} *14*; α(P)=4.20×10^{-7} *11* Mult.: from A_2=+0.25 *6*, A_4=−0.03 *8*; pol=3.1 *15* (1984Ga31).
715.7 *2*	0.10 *3*	1905.43	2^+	1189.43	3^-				
735.7 *1*	17.27 *22*	1189.43	3^-	453.87	2^+	E1		1.71×10^{-3}	α(K)=0.001470 *21*; α(L)=0.000188 *3*; α(M)=3.95×10^{-5} *6* α(N)=8.83×10^{-6} *13*; α(O)=1.338×10^{-6} *19*; α(P)=8.64×10^{-8} *13* Mult.: from A_2=−0.175 *24*, A_4=+0.031 *31* (1983Al12); pol=2.0 *3* (1984Ga31).
772.1 *3*	0.17 *6*	2148.89	(1,2^+)	1376.54	1^-				

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^{146}Nd(n,n′γ) 1983Al12,2004De49 (continued)

γ(^{146}Nd) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	α[@]	Comments
788.6 *1*	0.60 *4*	1977.77	2^+	1189.43	3^-	E1+(M2)	+0.06 *4*	0.00154 *10*	α(K)=0.00132 *8*; α(L)=0.000169 *12*; α(M)=3.56×10^{-5} *25* α(N)=8.0×10^{-6} *6*; α(O)=1.21×10^{-6} *9*; α(P)=7.8×10^{-8} *6* I_γ: Iγ(789)/Iγ(601)=69/31 (1994YaZT) agrees better with adopted values. Mult.: from A_2=−0.103 *37*, A_4=−0.014 *48* (1983Al12).
875.7 *1*	0.73 *5*	1918.89	4^+	1043.19	4^+	M1+(E2)	+0.03 *+16−11*	0.00464 *9*	α(K)=0.00398 *8*; α(L)=0.000521 *10*; α(M)=0.0001099 *20* α(N)=2.46×10^{-5} *5*; α(O)=3.76×10^{-6} *7*; α(P)=2.51×10^{-7} *5* Mult.,δ: from A_2=+0.340 *60*, A_4=+0.026 *70*; the second value of δ=+0.9 *3* (1983Al12); 4+→4$^+$ transition.
883.1 *1*	1.07 *6*	2072.56	3^-	1189.43	3^-	M1+E2	−3.0 *+4−2*	0.00310 *7*	α(K)=0.00263 *6*; α(L)=0.000366 *7*; α(M)=7.77×10^{-5} *15* α(N)=1.73×10^{-5} *4*; α(O)=2.60×10^{-6} *5*; α(P)=1.60×10^{-7} *4* Mult.,δ: from A_2=−0.424 *35*, A_4=+0.072 *46*; the second value of δ=−0.14 *3* (1983Al12).
906.4 *2*	0.46 *4*	2095.95	4^+	1189.43	3^-	E1+(M2)	+0.08 *2*	0.00119 *4*	α(K)=0.00102 *4*; α(L)=0.000131 *5*; α(M)=2.75×10^{-5} *10* α(N)=6.15×10^{-6} *22*; α(O)=9.3×10^{-7} *4*; α(P)=6.09×10^{-8} *22* Mult.: from A_2=−0.128 *32*, A_4=+0.011 *42* (1983Al12).
922.7 *1*	2.43 *5*	1376.54	1^-	453.87	2^+	E1+(M2)	+0.05 *4*	0.00111 *6*	α(K)=0.00096 *5*; α(L)=0.000122 *7*; α(M)=2.56×10^{-5} *14* α(N)=5.7×10^{-6} *3*; α(O)=8.7×10^{-7} *5*; α(P)=5.7×10^{-8} *3* Mult.: from A_2=−0.033 *8*, A_4=+0.014 *10* (1983Al12); pol=1.2 *3* (1984Ga31).
946.1 *1*	0.93 *4*	1989.25	4^+	1043.19	4^+	M1+E2	−0.14 *7*	0.00383 *7*	α(K)=0.00329 *6*; α(L)=0.000430 *7*; α(M)=9.07×10^{-5} *15* α(N)=2.03×10^{-5} *4*; α(O)=3.10×10^{-6} *5*; α(P)=2.07×10^{-7} *4* Mult.: from A_2=+0.251 *45*, A_4=+0.043 *57* (1983Al12).
979.1[a] *2*	0.08 *3*	2355.84	1^+	1376.54	1^-				E_γ: placement from 1983Al12. May be doubtful. Not seen in β^- decay.
1002.2 *2*	0.75 *9*	2045.40	4^-,5	1043.19	4^+	D			Mult.,δ: from A_2=−0.807 *25*, A_4=+0.010 *35*, ΔJ=1; δ=−0.65 *−?+8* or δ=+1.0 *−2+?* (1983Al12).
1016.5 *1*	3.92 *13*	1470.40	2^+	453.87	2^+	M1+E2	+5.7 *+16−10*	0.0022 *04*	α(K)=0.00188 *4*; α(L)=0.000257 *5*; α(M)=5.44×10^{-5} *9* α(N)=1.215×10^{-5} *20*; α(O)=1.83×10^{-6} *3*; α(P)=1.140×10^{-7} *20* Second value δ=−0.25 *4*; A $_2$=+0.050 *25*, A_4=−0.02 *3* (1983Al12); pol=0.58 *14* (1984Ga31).

^{146}Nd(n,n′γ) 1983Al12,2004De49 (continued)

γ(^{146}Nd) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	α[@]	Comments
1030.4[&] *6*	0.54[&] *20*	2072.56	3⁻	1043.19	4⁺	(E1)		8.84×10^{-4}	α(K)=0.000762 *11*; α(L)=9.63×10^{-5} *14*; α(M)=2.02×10^{-5} *3* α(N)=4.52×10^{-6} *7*; α(O)=6.87×10^{-7} *10*; α(P)=4.51×10^{-8} *7* Mult.: from 1994YaZT. I_γ: Iγ(1030)/Iγ(883)=16/84.
1030.4[&] *6*	0.54[&] *20*	2219.93	3⁺	1189.43	3⁻				
1036.5 *2*	0.20 *4*	2225.74	3⁺,4⁺	1189.43	3⁻				
1052.8 *2*	0.57 *4*	2095.95	4⁺	1043.19	4⁺	M1+E2	−0.71 *4*	0.00267 *5*	α(K)=0.00229 *4*; α(L)=0.000302 *5*; α(M)=6.36×10^{-5} *11* α(N)=1.424×10^{-5} *24*; α(O)=2.17×10^{-6} *4*; α(P)=1.424×10^{-7} *25* Mult.: from A_2=−0.085 *22*, A_4=−0.017 *29* (1983Al12).
1081.0 *4*	0.14 *4*	2457.11	2⁺	1376.54	1⁻				
1124.7 *1*	1.07 *4*	2167.90	3⁻	1043.19	4⁺	D+(Q)			Mult.: from A_2=−0.661 *53*, A_4=−0.018 *62* (1983Al12).
1139.5 *2*	0.35 *4*	2516.05	2⁻	1376.54	1⁻	M1+E2	0.28 *2*	0.00244	α(K)=0.00209 *3*; α(L)=0.000273 *4*; α(M)=5.75×10^{-5} *9* α(N)=1.287×10^{-5} *19*; α(O)=1.97×10^{-6} *3*; α(P)=1.311×10^{-7} *19*; α(IPF)=1.375×10^{-6} *21* E_γ: in 1983Al12, placement from 3058.6 keV level which not seen by others. Mult.: from A_2=+0.181 *23*, A_4=+0.004 *26* (1983Al12).
1148.8 *1*	1.54 *5*	1602.68	0⁺	453.87	2⁺	E2		1.68×10^{-3}	α(K)=0.001433 *20*; α(L)=0.000193 *3*; α(M)=4.08×10^{-5} *6* α(N)=9.12×10^{-6} *13*; α(O)=1.377×10^{-6} *20*; α(P)=8.69×10^{-8} *13*; α(IPF)=1.77×10^{-6} *3* Mult.: from A_2=−0.024 *40*, A_4=+0.001 *46* (1983Al12).
1169.0 *3*	0.70 *7*	2913.52	3	1745.00	4⁺	D+(Q)	+0.06 *10*		Mult.: from A_2=−0.150 *90*, A_4=+0.186 *84* (1983Al12).
1176.7 *2*	0.35 *4*	2219.93	3⁺	1043.19	4⁺	M1+E2	+3.3 *+15−9*	0.00166 *6*	α(K)=0.00142 *5*; α(L)=0.000190 *6*; α(M)=4.01×10^{-5} *12* α(N)=9.0×10^{-6} *3*; α(O)=1.35×10^{-6} *4*; α(P)=8.6×10^{-8} *3*; α(IPF)=3.64×10^{-6} *6* Mult.,δ: from A_2=−0.442 *68*, A_4=+0.164 *94*; the second value of δ=+0.44 *12*, α=0.00220 *7* (1983Al12); 3+→4⁺ transition.
1182.4 *2*	0.40 *4*	2225.74	3⁺,4⁺	1043.19	4⁺	M1+E2	−0.35 *5*	0.00222	α(K)=0.00190 *4*; α(L)=0.000247 *4*; α(M)=5.21×10^{-5} *9* α(N)=1.168×10^{-5} *20*; α(O)=1.78×10^{-6} *3*; α(P)=1.189×10^{-7} *21*; α(IPF)=4.23×10^{-6} *7* Mult.,δ: from A_2=+0.175 *17*, A_4=−0.004; δ=−0.35 *5* (J=3) or −0.26 *3* (J=4) (1983Al12); 3⁺,4+→4⁺ transition.
1190.2 *4*	0.34 *6*	3178.70	3⁺,(5⁺)	1989.25	4⁺				
1234.0[#] *5*	100	2610.8	0⁺	1376.54	1⁻	(E1)		6.80×10^{-4}	α(K)=0.000549 *8*; α(L)=6.90×10^{-5} *10*;

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γ(^{146}Nd) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	α[@]	Comments
									α(M)=1.447×10^{-5} *21* α(N)=3.24×10^{-6} *5*; α(O)=4.92×10^{-7} *7*; α(P)=3.26×10^{-8} *5*; α(IPF)=4.31×10^{-5} *7*
1243.2 *1*	1.12 *4*	2286.37	2$^+$	1043.19	4$^+$	E2		1.44×10^{-3}	α(K)=0.001223 *18*; α(L)=0.0001631 *23*; α(M)=3.44×10^{-5} *5* α(N)=7.70×10^{-6} *11*; α(O)=1.164×10^{-6} *17*; α(P)=7.42×10^{-8} *11*; α(IPF)=1.153×10^{-5} *17* Mult.: from A_2=+0.066 *12*, A_4=−0.047 *15*; δ=0.01 *3* (1983Al12).
1247.6 *3*	0.14 *4*	2436.59	2$^+$	1189.43	3$^-$				
1286.2 *4*	0.23 *5*	2756.8	1$^-$	1470.40	2$^+$				
1291.7 *2*	0.69 *4*	1745.00	4$^+$	453.87	2$^+$	E2		1.34×10^{-3}	α(K)=0.001134 *16*; α(L)=0.0001505 *21*; α(M)=3.18×10^{-5} *5* α(N)=7.10×10^{-6} *10*; α(O)=1.075×10^{-6} *15*; α(P)=6.88×10^{-8} *10*; α(IPF)=1.94×10^{-5} *3* Mult.: from A_2=+0.303 *34*, A_4=−0.066 *39* (1983Al12).
1313.6 *2*	0.25 *5*	2356.80	4$^+$	1043.19	4$^+$	M1+E2	0.47 *5*	0.00173 *3*	α(K)=0.00146 *3*; α(L)=0.000190 *4*; α(M)=4.00×10^{-5} *7* α(N)=8.97×10^{-6} *15*; α(O)=1.370×10^{-6} *24*; α(P)=9.13×10^{-8} *16*; α(IPF)=2.42×10^{-5} *4* 1983Al12 places this γ from 3058.6 keV level which not seen by others. Mult.: from A_2=+0.395 *46*, A_4=+0.062 *57* (1983Al12).
1323.3 *1*	2.90 *8*	1777.18	3$^+$	453.87	2$^+$	E2		1.29×10^{-3}	α(K)=0.001081 *16*; α(L)=0.0001431 *20*; α(M)=3.02×10^{-5} *5* α(N)=6.75×10^{-6} *10*; α(O)=1.023×10^{-6} *15*; α(P)=6.56×10^{-8} *10*; α(IPF)=2.56×10^{-5} *4* Mult.,δ: from A_2=+0.06 *3*, A_4=+0.16 *4*; 1/δ=−0.011 *+21−5*, pol=1.8 *5* (1984Ga31). Other: δ=+0.16 *1*, second value δ=−16 *+8−6* (1983Al12).
1333.2 *1*	2.88 *8*	1787.11	2$^+$	453.87	2$^+$	E2+M1	−0.59 *+10−12*	0.00164 *5*	α(K)=0.00138 *4*; α(L)=0.000180 *5*; α(M)=3.79×10^{-5} *10* α(N)=8.48×10^{-6} *23*; α(O)=1.29×10^{-6} *4*; α(P)=8.6×10^{-8} *3*; α(IPF)=2.85×10^{-5} *4* Mult.: from A_2=−0.11 *4*, A_4=+0.0 *5*; pol=1.9 *7* (1984Ga31).
1363.6 *5*	100	2553.0	2$^+$	1189.43	3$^-$	E1+M2		0.00068 *4*	α(K)=0.00049 *3*; α(L)=6.2×10^{-5} *4*; α(M)=1.29×10^{-5} *9* α(N)=2.89×10^{-6} *19*; α(O)=4.4×10^{-7} *3*; α(P)=2.92×10^{-8} *19*; α(IPF)=0.0001142 *20* E_γ,Mult.: from 1994YaZT.
1376.5 *1*	4.38 *11*	1376.54	1$^-$	0.0	0$^+$	E1		6.49×10^{-4}	α(K)=0.000454 *7*; α(L)=5.68×10^{-5} *8*; α(M)=1.190×10^{-5} *17* α(N)=2.66×10^{-6} *4*; α(O)=4.06×10^{-7} *6*; α(P)=2.69×10^{-8} *4*; α(IPF)=0.0001239 *18* Mult.: from A_2=−0.144 *29*, A_4=+0.033 *32* (1983Al12);

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^{146}Nd(n,n′γ) 1983Al12,2004De49 (continued)

γ(^{146}Nd) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	δ ‡	α @	Comments
									pol=2.0 *3* (1984Ga31). I_γ: Iγ(1376)/Iγ(923)=38/62 (1994YaZT), =34/66 (1995Di06).
1391.7 *3*	0.14 *4*	2434.9	4^+	1043.19	4^+				
1426.3 *2*	0.21 *3*	2469.50	$2^+,5^+,(3^+,4^+)$	1043.19	4^+				
1451.6 *1*	2.16 *9*	1905.43	2^+	453.87	2^+	M1+E2	−0.37 *9*	0.00145 *3*	α(K)=0.001192 *25*; α(L)=0.000154 *3*; α(M)=3.24×10^{-5} *7* α(N)=7.27×10^{-6} *15*; α(O)=1.110×10^{-6} *23*; α(P)=7.43×10^{-8} *16*; α(IPF)=6.30×10^{-5} *9* Mult.: from A_2=−0.02 *4*, A_4=−0.00 *4*; pol=1.8 *6* (1984Ga31).
1465.0 *1*	0.94 *4*	1918.89	4^+	453.87	2^+	E2		1.10×10^{-3}	α(K)=0.000887 *13*; α(L)=0.0001163 *17*; α(M)=2.45×10^{-5} *4* α(N)=5.48×10^{-6} *8*; α(O)=8.32×10^{-7} *12*; α(P)=5.39×10^{-8} *8*; α(IPF)=6.47×10^{-5} *9* Mult.,δ: from A_2=+0.389 *72*, A_4=−0.079 *78*; δ=+0.05 *9* (1983Al12).
1470.4 *1*	3.48 *6*	1470.40	2^+	0.0	0^+	E2		1.09×10^{-3}	α(K)=0.000881 *13*; α(L)=0.0001154 *17*; α(M)=2.43×10^{-5} *4* α(N)=5.44×10^{-6} *8*; α(O)=8.25×10^{-7} *12*; α(P)=5.35×10^{-8} *8*; α(IPF)=6.64×10^{-5} *10* Mult.: from A_2=+0.312 *34*, A_4=−0.092 *67* (1983Al12).
1509.8 *5*	59	2553.0	2^+	1043.19	4^+	(E2)		1.06×10^{-3}	α(K)=0.000838 *12*; α(L)=0.0001094 *16*; α(M)=2.31×10^{-5} *4* α(N)=5.16×10^{-6} *8*; α(O)=7.83×10^{-7} *11*; α(P)=5.09×10^{-8} *8*; α(IPF)=7.97×10^{-5} *12* E_γ,I_γ: from (n,n′γ) (1994YaZT).
1523.7 *1*	2.37 *7*	1977.77	2^+	453.87	2^+	M1+E2	−0.07 *40*	0.00137 *7*	α(K)=0.00110 *6*; α(L)=0.000142 *7*; α(M)=2.99×10^{-5} *14* α(N)=6.7×10^{-6} *3*; α(O)=1.03×10^{-6} *5*; α(P)=6.9×10^{-8} *4*; α(IPF)=8.92×10^{-5} *15* Mult.,δ: from A_2=+0.177 *29*, A_4=−0.001 *38*; the second value of δ=+2.8 *4*. Other: δ=0.03 *3*, 2+→2^+ transition (1978Ik03).
1535.4 *2*	0.41 *4*	1989.25	4^+	453.87	2^+	E2		1.03×10^{-3}	α(K)=0.000811 *12*; α(L)=0.0001058 *15*; α(M)=2.23×10^{-5} *4* α(N)=4.99×10^{-6} *7*; α(O)=7.57×10^{-7} *11*; α(P)=4.93×10^{-8} *7*; α(IPF)=8.87×10^{-5} *13* Mult.: from A_2=+0.378 *41*, A_4=−0.085 *51*, δ=0.05 *5* (1983Al12).
1642.4 *4*	0.21 *4*	2095.95	4^+	453.87	2^+				
1665.3 *2*	0.24 *4*	2119.50	2^+	453.87	2^+				

γ(^{146}Nd) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	α[@]	Comments
1665.5[#] *5*		2855.3	2^+	1189.43	3^-	(E1)		7.17×10^{-4}	α(K)=0.000329 *5*; α(L)=4.10×10^{-5} *6*; α(M)=8.59×10^{-6} *12* α(N)=1.92×10^{-6} *3*; α(O)=2.93×10^{-7} *5*; α(P)=1.96×10^{-8} *3*; α(IPF)=0.000336 *5*
1689.4 *2*	0.65 *4*	2143.17	2^+	453.87	2^+	M1+E2	−0.48 *3*	1.13×10^{-3} *2*	α(K)=0.000840 *13*; α(L)=0.0001080 *16*; α(M)=2.27×10^{-5} *4* α(N)=5.09×10^{-6} *8*; α(O)=7.78×10^{-7} *12*; α(P)=5.21×10^{-8} *8*; α(IPF)=0.0001581 *23* Mult.,δ: from A_2=−0.074 *12*, A_4=−0.012 *15*; the second value of δ=+0.34 *8* (J^π=1^+) (1983Al12); $2^+\rightarrow2^+$ transition.
1696.1 *5*	0.16 *5*	2148.89	$(1,2^+)$	453.87	2^+				
1743.5 *2*	0.87 *6*	2197.38	2^+	453.87	2^+	M1+E2	+2.9 *4*	9.39×10^{-4} *15*	α(K)=0.000658 *11*; α(L)=8.48×10^{-5} *14*; α(M)=1.79×10^{-5} *3* α(N)=4.00×10^{-6} *7*; α(O)=6.08×10^{-7} *10*; α(P)=4.01×10^{-8} *7*; α(IPF)=0.0001742 *25* Mult.: from A_2=+0.165 *26*, A_4=−0.052 *32* (1983Al12).
1766.2 *2*	0.60 *4*	2219.93	3^+	453.87	2^+	E2		9.08×10^{-4}	α(K)=0.000623 *9*; α(L)=8.04×10^{-5} *12*; α(M)=1.692×10^{-5} *24* α(N)=3.79×10^{-6} *6*; α(O)=5.76×10^{-7} *8*; α(P)=3.78×10^{-8} *6*; α(IPF)=0.000183 *3* Mult.: A_2=+0.400 *95*, A_4=−0.033 *108*.
1771.8 *2*	0.35 *4*	2225.74	$3^+,4^+$	453.87	2^+				
1778.4 *3*	0.27 *5*	2232.3	3^-	453.87	2^+				
1787.2 *2*	0.33 *4*	1787.11	2^+	0.0	0^+	E2		9.01×10^{-4}	α(K)=0.000610 *9*; α(L)=7.86×10^{-5} *11*; α(M)=1.654×10^{-5} *24* α(N)=3.70×10^{-6} *6*; α(O)=5.63×10^{-7} *8*; α(P)=3.70×10^{-8} *6*; α(IPF)=0.000192 *3* Mult.: from A_2=+0.281 *35*, A_4=−0.013 *44* (1983Al12).
1812.0 *2*	0.56 *4*	2265.89	2^+	453.87	2^+	M1+E2		1.06×10^{-3}	α(K)=0.000729 *11*; α(L)=9.36×10^{-5} *14*; α(M)=1.97×10^{-5} *3* α(N)=4.41×10^{-6} *7*; α(O)=6.74×10^{-7} *10*; α(P)=4.53×10^{-8} *7*; α(IPF)=0.000217 *3* Mult.: from A_2=+0.374 *48*, A_4=−0.006 *59*; δ=0.40 *+?−16*, the second value δ=0.95 *+35−?* $2^+\rightarrow2^+$ transition (1983Al12).
1831.7 *5*	0.34 *4*	2286.37	2^+	453.87	2^+	M1+E2	−0.19 *3*	1.07×10^{-3} *2*	α(K)=0.000728 *11*; α(L)=9.33×10^{-5} *14*; α(M)=1.96×10^{-5} *3* α(N)=4.40×10^{-6} *7*; α(O)=6.73×10^{-7} *10*; α(P)=4.53×10^{-8} *7*; α(IPF)=0.000228 *4* Mult.,δ: from A_2=+0.083 *14*, A_4=−0.003 *17*; the second value of δ=+4.4 *+4−5* (1983Al12); $2^+\rightarrow2^+$ transition.
1842.4[#] *5*		2885.6	(4^+)	1043.19	4^+	(E2)		8.87×10^{-4}	α(K)=0.000576 *8*; α(L)=7.41×10^{-5} *11*; α(M)=1.559×10^{-5} *22* α(N)=3.49×10^{-6} *5*; α(O)=5.31×10^{-7} *8*; α(P)=3.50×10^{-8} *5*; α(IPF)=0.000217 *3*
1862.4[#] *5*		2905.6	$3^+,4^+$	1043.19	4^+	(E2)		8.83×10^{-4}	α(K)=0.000565 *8*; α(L)=7.26×10^{-5} *11*; α(M)=1.527×10^{-5} *22* α(N)=3.42×10^{-6} *5*; α(O)=5.20×10^{-7} *8*; α(P)=3.43×10^{-8} *5*; α(IPF)=0.000227 *4*
1869.8 *5*		2913.52	3	1043.19	4^+				α(K)=0.000561 *8*; α(L)=7.21×10^{-5} *10*; α(M)=1.516×10^{-5} *22*; α(N+..)=0.000234 *4* α(N)=3.39×10^{-6} *5*; α(O)=5.16×10^{-7} *8*; α(P)=3.40×10^{-8} *5*; α(IPF)=0.000230 *4*

$^{146}_{60}Nd_{86}$-8

^{146}Nd(n,n′γ) 1983Al12,2004De49 (continued)

γ(^{146}Nd) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ‡	α@	Comments
1881.8 *2*	0.59 *4*	2335.69	3−	453.87	2+	E1(+M2)	−0.02 *4*	8.10×10^{-4}	α(K)=0.000270 *6*; α(L)=3.36×10^{-5} *7*; α(M)=7.03×10^{-6} *15* α(N)=1.57×10^{-6} *4*; α(O)=2.40×10^{-7} *5*; α(P)=1.61×10^{-8} *4*; α(IPF)=0.000497 *7* Mult.: from 1994YaZT. δ: from A_2=−0.238 *70*, A_4=+0.001 *81* (1983Al12).
1902.0 *3*	0.23 *4*	2355.84	1+	453.87	2+				I_γ: Iγ(1902γ)/Iγ(2356γ)=0.16 *5* in β^- decay, compared with 0.53 *10* here. Perhaps part of 1902 should be placed elsewhere.
1977.4 *2*	0.28 *2*	1977.77	2+	0.0	0+	E2		8.68×10^{-4}	α(K)=0.000506 *7*; α(L)=6.48×10^{-5} *9*; α(M)=1.362×10^{-5} *19* α(N)=3.05×10^{-6} *5*; α(O)=4.64×10^{-7} *7*; α(P)=3.07×10^{-8} *5*; α(IPF)=0.000280 *4* I_γ: 0.28 *20* in table 1 of 1983Al12 is probably a misprint. Mult.: from A_2=+0.322 *50*, A_4=−0.036 *61* (1983Al12).
1982.5 *2*	0.88 *5*	2436.59	2+	453.87	2+	M1+E2	−0.18 *2*	1.02×10^{-3}	α(K)=0.000613 *9*; α(L)=7.84×10^{-5} *11*; α(M)=1.649×10^{-5} *24* α(N)=3.70×10^{-6} *6*; α(O)=5.65×10^{-7} *8*; α(P)=3.81×10^{-8} *6*; α(IPF)=0.000305 *5* Mult.,δ: from A_2=+0.089 *14*, A_4=+0.008 *17*; δ=+0.25 *2* (if J=3) (1983Al12).
2002.9 *3*	0.56 *6*	2457.11	2+	453.87	2+	M1+E2	+1.6 *+4−5*	0.00091 *3*	α(K)=0.000525 *20*; α(L)=6.7×10^{-5} *3*; α(M)=1.41×10^{-5} *6* α(N)=3.16×10^{-6} *13*; α(O)=4.82×10^{-7} *19*; α(P)=3.21×10^{-8} *14*; α(IPF)=0.000299 *6* Mult.,δ: from A_2=+0.282 *80*, A_4=+0.048 *92*; the second value of δ=+0.14 *+20−14* if 2+→2^+ transition (1983Al12).
2037.2 *2*	0.36 *4*	2491.09	2+,3+	453.87	2+	M1+E2		1.00×10^{-3} *2*	α(K)=0.000575 *11*; α(L)=7.34×10^{-5} *14*; α(M)=1.54×10^{-5} *3* α(N)=3.46×10^{-6} *7*; α(O)=5.29×10^{-7} *10*; α(P)=3.57×10^{-8} *7*; α(IPF)=0.000333 *5* Mult.: from A_2=−0.206 *78*, A_4=+0.111 *165*; δ=−0.85 *+47−?* (J=2), δ=+0.01 *+13−?* (J=3) (1983Al12); 2+,3+→2^+ transition.
2107.8 *2*	0.33 *3*	2561.69	3+	453.87	2+	M1+E2		9.99×10^{-4}	Mult.: from A_2=−0.507 *356*, A_4=+0.144 *336*; δ=−0.27 *+33−?*, 3+→2^+ transition (1983Al12). Mult.: from A_2=−0.507 *356*, A_4=+0.144 *336* (1983Al12).
2119.8 *2*	0.26 *3*	2119.50	2+	0.0	0+	E2		8.66×10^{-4}	α(K)=0.000446 *7*; α(L)=5.69×10^{-5} *8*; α(M)=1.195×10^{-5} *17* α(N)=2.67×10^{-6} *4*; α(O)=4.08×10^{-7} *6*; α(P)=2.71×10^{-8} *4*; α(IPF)=0.000348 *5* Mult.: from A_2=+0.305 *87*, A_4=−0.067 *83* (1983Al12).
2135.3 *2*	0.39 *4*	3178.70	3+,(5+)	1043.19	4+	M1+E2		0.00092 *6*	α(K)=0.00048 *4*; α(L)=6.1×10^{-5} *5*; α(M)=1.28×10^{-5} *10* α(N)=2.86×10^{-6} *23*; α(O)=4.4×10^{-7} *4*; α(P)=2.9×10^{-8} *3*; α(IPF)=0.000369 *15* Mult.: from A_2=−0.536 *95*, A_4=−0.125 *129*; δ=+0.6 *+?−2*, 3+→4^+ transition or δ=−0.19 *8*, 5+→4^+ transition (1983Al12).
2142.9 *3*	0.15 *3*	2143.17	2+	0.0	0+				

$^{146}_{60}Nd_{86}$-9

^{146}Nd(n,n′γ) 1983Al12,2004De49 (continued)

γ(^{146}Nd) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	α[@]	Comments
2148.8 *2*	0.27 *4*	2148.89	(1,2$^+$)	0.0	0$^+$				
2157.1[#] *5*	28	2610.8	0$^+$	453.87	2$^+$	(E2)		8.68×10^{-4}	α(K)=0.000432 *6*; α(L)=5.50×10^{-5} *8*; α(M)=1.157×10^{-5} *17* α(N)=2.59×10^{-6} *4*; α(O)=3.95×10^{-7} *6*; α(P)=2.62×10^{-8} *4*; α(IPF)=0.000366 *6* I_γ: Iγ(2157)/Iγ(1234)=0.28.
2208.4 *3*	0.28 *4*	2208.34	2$^+$	0.0	0$^+$	E2		8.72×10^{-4}	α(K)=0.000414 *6*; α(L)=5.27×10^{-5} *8*; α(M)=1.107×10^{-5} *16* α(N)=2.48×10^{-6} *4*; α(O)=3.78×10^{-7} *6*; α(P)=2.51×10^{-8} *4*; α(IPF)=0.000391 *6* Mult.: from A_2=+0.310 *25*, A_4=−0.057 *30* (1983Al12).
2265.9 *4*	0.21 *4*	2265.89	2$^+$	0.0	0$^+$				
2302.9 *4*	0.32 *5*	2756.8	1$^-$	453.87	2$^+$				
2355.8 *2*	0.43 *4*	2355.84	1$^+$	0.0	0$^+$	D			Mult.: from A_2=−0.140 *38*, A_4=−0.015 *47* (1983Al12).
2401.5[#] *5*		2855.3	2$^+$	453.87	2$^+$	E2		8.96×10^{-4}	α(K)=0.000357 *5*; α(L)=4.52×10^{-5} *7*; α(M)=9.48×10^{-6} *14* α(N)=2.12×10^{-6} *3*; α(O)=3.24×10^{-7} *5*; α(P)=2.16×10^{-8} *3*; α(IPF)=0.000483 *7* I_γ: Iγ(2402)/Iγ(1665)=0.53.
2459.5 *2*	0.41 *4*	2913.52	3	453.87	2$^+$	D+(Q)	−0.03 *4*		Mult.: from A_2=−0.266 *39*, A_4=+0.030 *36* (1983Al12).
2682		2682.0	1$^-$	0.0	0$^+$	E1		1.20×10^{-3}	α(K)=0.0001560 *22*; α(L)=1.92×10^{-5} *3*; α(M)=4.02×10^{-6} *6* α(N)=9.00×10^{-7} *13*; α(O)=1.375×10^{-7} *20*; α(P)=9.27×10^{-9} *13*; α(IPF)=0.001023 *15* E_γ,Mult.: from γ(θ) 1995Di06. E=2681.35 *25* in ^{146}Pr β$^-$ decay.
2757.2 *6*	0.25 *4*	2756.8	1$^-$	0.0	0$^+$	E1		1.24×10^{-3}	α(K)=0.0001497 *21*; α(L)=1.84×10^{-5} *3*; α(M)=3.86×10^{-6} *6* α(N)=8.63×10^{-7} *12*; α(O)=1.319×10^{-7} *19*; α(P)=8.90×10^{-9} *13*; α(IPF)=0.001067 *15* Mult.: from γ(θ) 1995Di06.
2777.2 *5*	0.22 *5*	2777.2	1,2$^+$	0.0	0$^+$				
2855.4[#] *5*		2855.3	2$^+$	0.0	0$^+$	E2		9.96×10^{-4}	α(K)=0.000263 *4*; α(L)=3.31×10^{-5} *5*; α(M)=6.94×10^{-6} *10* α(N)=1.553×10^{-6} *22*; α(O)=2.37×10^{-7} *4*; α(P)=1.594×10^{-8} *23*; α(IPF)=0.000692 *10* I_γ: Iγ(2855)/Iγ(1665)=0.23.

[†] From 1983Al12, except as noted.
[‡] From γ(θ) and linear pol of γ (1983Al12,1984Ga31), except as noted. Evaluators assumed that pure Q γ′s are E2 and γ′s with large δ are M1+E2.
[#] From 1994YaZT. ΔEγ=0.5 assumed by the evaluators.
[@] Additional information 1.
[&] Multiply placed with undivided intensity.
[a] Placement of transition in the level scheme is uncertain.

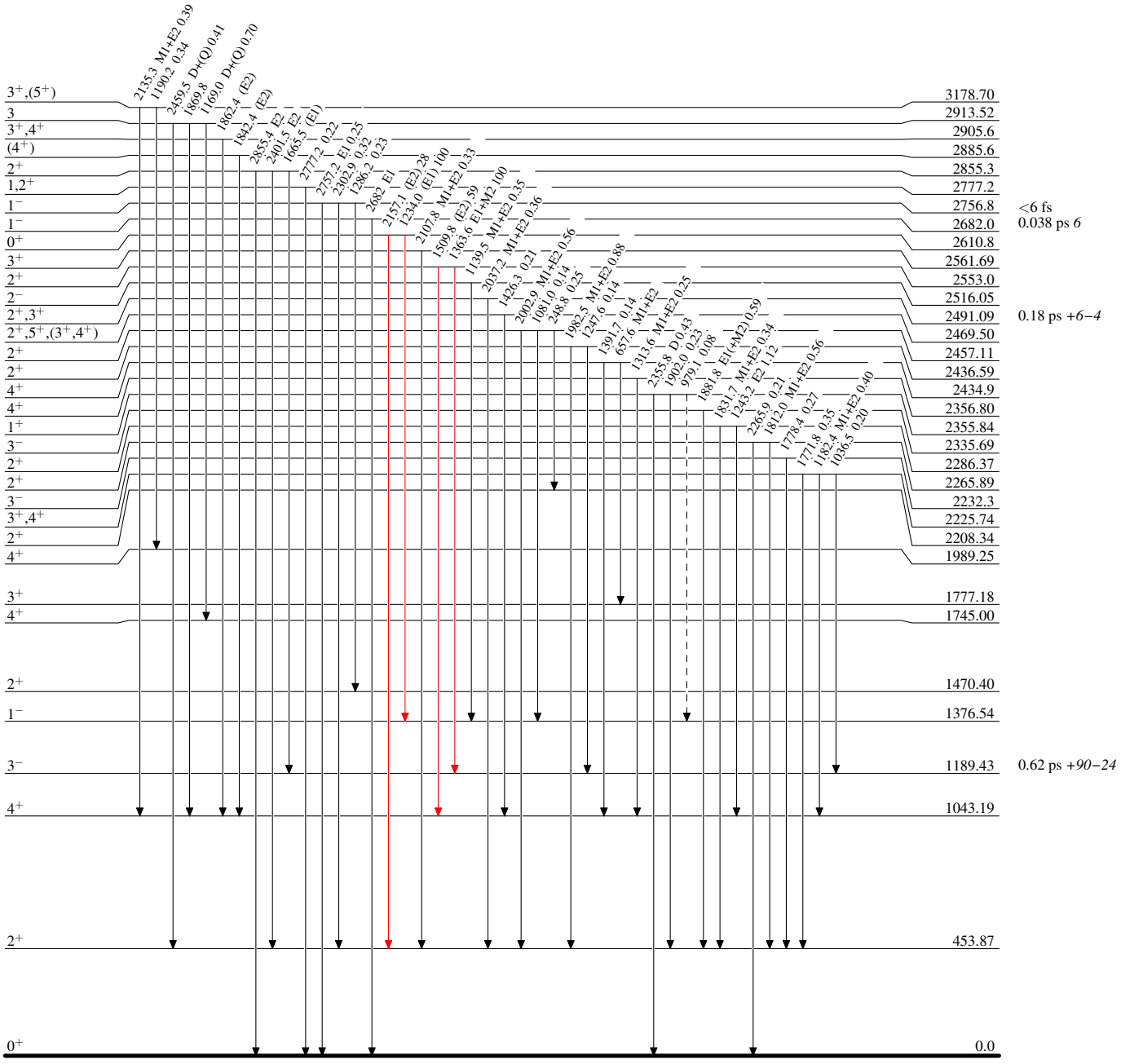
$^{146}_{60}Nd_{86}$-10

^{146}Nd(n,n′γ) 1983Al12,2004De49

Level Scheme

Intensities: Relative I_γ

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)



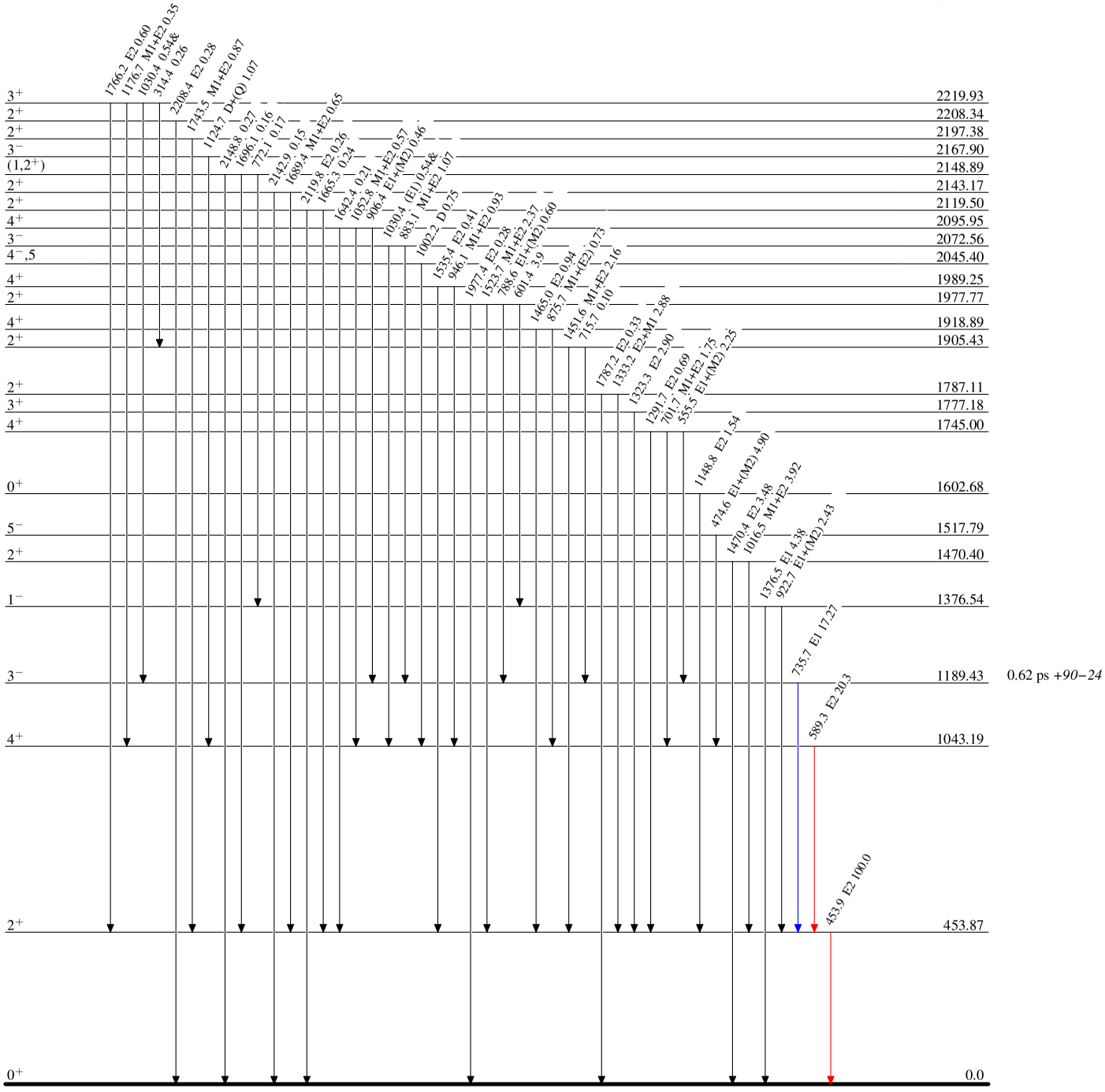
$^{146}_{60}Nd_{86}$

^{146}Nd(n,n′γ) 1983Al12,2004De49

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

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



$^{146}_{60}Nd_{86}$