

Adopted Levels, Gammas

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

$Q(\beta^-)=-2141$ 16; $S(n)=8476$ 16; $S(p)=4013$ 15; $Q(\alpha)=-40$ 40 [2017Wa10](#)
 $S(2n)=18955$ 23, $S(2p)=10700$ 23 ([2017Wa10](#)).
 α : [Additional information 1](#).

 ^{136}Pr LevelsCross Reference (XREF) Flags

A ^{136}Nd ε decay
B $^{110}\text{Pd}(^{30}\text{Si},p3n\gamma)$

E(level) [†]	J ^π	T _{1/2}	XREF	Comments
0.0	2 ⁺	13.1 min 1	AB	$\% \varepsilon + \% \beta^+ = 100$ J ^π : J from atomic beam measurements (1976Fu06,1972Ek04); π from $\log ft=5.6$ to 2 ⁺ . T _{1/2} : from 1971Ke07 . Other: 12.9 min 4 (1973Bu11). J ^π : M1+E2 40 γ to 2 ⁺ , M1+E2 109 γ from 1 ⁺ . T _{1/2} : from $\gamma\gamma(t)$ in ^{136}Nd ε decay.
40.19 7	1 ⁺ ,2 ⁺	9.25 ns 20	AB	J ^π : M1+E2 130 γ to 2 ⁺ g.s., population in $^{110}\text{Pd}(^{30}\text{Si},p3n\gamma)$. $\log ft=7.22$ in ^{136}Nd ε decay ($J^\pi=0^+$) is in disagreement with this assignment, however the branch is weak and could be explained by incompleteness of the decay scheme.
130.57 11	(3) ⁺		AB	J ^π : log $ft=6.6$ in ε decay of 0 ⁺ parent, M1 100.5 γ to 1 ⁺ ,2 ⁺ . J ^π : log $ft=5.0$ in ε decay of 0 ⁺ parent, M1 149 γ to 2 ⁺ . T _{1/2} : from (K-x ray)(109 γ)(t) in ^{136}Nd ε decay. J ^π : E1 44 γ to (3) ⁺ .
140.69 12	0 ⁺ ,1 ⁺		A	J ^π : log $ft=7.0$ in ε decay from 0 ⁺ parent, M1 184.5 γ to 2 ⁺ .
149.11 8	1 ⁺	<0.8 ns	A	J ^π : log $ft=7.5$ in β decay of 0 ⁺ parent, E2 294.6 γ to 2 ⁺ , 204.3 γ to (3) ⁺ . J ^π : stretched E2 338.5 γ to 2 ⁺ .
174.49 19	(4) ⁻		B	J ^π : log $ft=6.4$ in ε decay of 0 ⁺ parent, M1+E2 477 γ to 2 ⁺ .
184.50 10	1 ⁺		AB	J ^π : M1+E2 417 γ to (3) ⁺ , $\Delta J=0$ (M1+E2) 209 γ to 4 ⁺ .
334.70 17	(1) ⁺		A	J ^π : log $ft=5.5$ in ε decay from 0 ⁺ parent, M1(+E2) 575 γ to 2 ⁺ . J ^π : log $ft=6.4$ in ε decay of 0 ⁺ parent, M1+E2 477 γ to 2 ⁺ . J ^π : M1+E2 417 γ to (3) ⁺ , $\Delta J=0$ (M1+E2) 209 γ to 4 ⁺ . J ^π : log $ft=5.5$ in ε decay from 0 ⁺ parent, M1(+E2) 575 γ to 2 ⁺ . $\mu=3.42$ 11 (1993Ba42) T _{1/2} : from $\gamma(t)$ and $\gamma\gamma(t)$ in $^{110}\text{Pd}(^{30}\text{Si},p3n\gamma)$. J ^π : E2 46.8 γ to (4) ⁺ . μ : from TDPAD (1993Ba42). J ^π : log $ft=6.8$ in ε decay from 0 ⁺ parent, E2(+M1) 672 γ to 2 ⁺ . J ^π : log $ft=6.6$ in ε decay from 0 ⁺ parent, M1(+E2) 653 γ to 1 ⁺ . J ^π : D 209 γ to (6) ⁺ . J ^π : log $ft=6.1$ in ε decay from 0 ⁺ parent, E2,(M1) 904 γ to 2 ⁺ . J ^π : log $ft=6.5$ in ε decay from 0 ⁺ parent, M1,(E2) 972 γ to 2 ⁺ . J ^π : log $ft=7.0$ in ε decay from 0 ⁺ parent, (E2,M1) 856 γ to 1 ⁺ . J ^π : D 245 γ to (7 ⁺). J ^π : log $ft=6.6$ in ε decay from 0 ⁺ parent, E2,M1 922 γ to 1 ⁺ . J ^π : D 521 γ to (6) ⁺ . J ^π : log $ft=6.3$ in ε decay from 0 ⁺ parent, 1041 γ to (3 ⁺). J ^π : log $ft=6.5$ in ε decay from 0 ⁺ parent. J ^π : D 136 γ to (8 ⁺); band assignment. J ^π : (E2) 722 γ to (6) ⁺ . J ^π : (E2) 752 γ to (6) ⁺ . J ^π : log $ft=6.0$ in ε decay from 0 ⁺ parent, E2 426 γ to (0,1) ⁺ . J ^π : D 336.5 γ to (9 ⁺); band assignment.
174.49 19	(4) ⁻		B	J ^π : E1 44 γ to (3) ⁺ .
184.50 10	1 ⁺		AB	J ^π : log $ft=7.0$ in ε decay from 0 ⁺ parent, M1 184.5 γ to 2 ⁺ .
334.70 17	(1) ⁺		A	J ^π : log $ft=7.5$ in β decay of 0 ⁺ parent, E2 294.6 γ to 2 ⁺ , 204.3 γ to (3) ⁺ .
338.43 14	4 ⁺		B	J ^π : stretched E2 338.5 γ to 2 ⁺ .
351.87 14			B	
476.62 14	1 ⁺		A	J ^π : log $ft=6.4$ in ε decay of 0 ⁺ parent, M1+E2 477 γ to 2 ⁺ .
547.82 14	(4) ⁺		B	J ^π : M1+E2 417 γ to (3) ⁺ , $\Delta J=0$ (M1+E2) 209 γ to 4 ⁺ .
574.82 9	1 ⁺		A	J ^π : log $ft=5.5$ in ε decay from 0 ⁺ parent, M1(+E2) 575 γ to 2 ⁺ . $\mu=3.42$ 11 (1993Ba42) T _{1/2} : from $\gamma(t)$ and $\gamma\gamma(t)$ in $^{110}\text{Pd}(^{30}\text{Si},p3n\gamma)$. J ^π : E2 46.8 γ to (4) ⁺ . μ : from TDPAD (1993Ba42). J ^π : log $ft=6.8$ in ε decay from 0 ⁺ parent, E2(+M1) 672 γ to 2 ⁺ . J ^π : log $ft=6.6$ in ε decay from 0 ⁺ parent, M1(+E2) 653 γ to 1 ⁺ . J ^π : D 209 γ to (6) ⁺ . J ^π : log $ft=6.1$ in ε decay from 0 ⁺ parent, E2,(M1) 904 γ to 2 ⁺ . J ^π : log $ft=6.5$ in ε decay from 0 ⁺ parent, M1,(E2) 972 γ to 2 ⁺ . J ^π : log $ft=7.0$ in ε decay from 0 ⁺ parent, (E2,M1) 856 γ to 1 ⁺ . J ^π : D 245 γ to (7 ⁺). J ^π : log $ft=6.6$ in ε decay from 0 ⁺ parent, E2,M1 922 γ to 1 ⁺ . J ^π : D 521 γ to (6) ⁺ . J ^π : log $ft=6.3$ in ε decay from 0 ⁺ parent, 1041 γ to (3 ⁺). J ^π : log $ft=6.5$ in ε decay from 0 ⁺ parent. J ^π : D 136 γ to (8 ⁺); band assignment. J ^π : (E2) 722 γ to (6) ⁺ . J ^π : (E2) 752 γ to (6) ⁺ . J ^π : log $ft=6.0$ in ε decay from 0 ⁺ parent, E2 426 γ to (0,1) ⁺ . J ^π : D 336.5 γ to (9 ⁺); band assignment.
594.60 20	(6) ⁺	91 ns 1	B	
672.79 22	(1) ⁺		A	J ^π : log $ft=6.8$ in ε decay from 0 ⁺ parent, E2(+M1) 672 γ to 2 ⁺ .
793.3 3	0 ⁺ ,1 ⁺		A	J ^π : log $ft=6.6$ in ε decay from 0 ⁺ parent, M1(+E2) 653 γ to 1 ⁺ .
804.0 3	(7 ⁺)		B	J ^π : D 209 γ to (6) ⁺ .
940.09 21	(1) ⁺		A	J ^π : log $ft=6.1$ in ε decay from 0 ⁺ parent, E2,(M1) 904 γ to 2 ⁺ .
972.3 4	(1) ⁺		A	J ^π : log $ft=6.5$ in ε decay from 0 ⁺ parent, M1,(E2) 972 γ to 2 ⁺ .
1004.8 4	(0 ⁺ ,1 ⁺)		A	J ^π : log $ft=7.0$ in ε decay from 0 ⁺ parent, (E2,M1) 856 γ to 1 ⁺ .
1048.8 3	(8 ⁺)		B	J ^π : D 245 γ to (7 ⁺).
1062.6 3	(0,1) ⁺		A	J ^π : log $ft=6.6$ in ε decay from 0 ⁺ parent, E2,M1 922 γ to 1 ⁺ .
1116.0 3	(7)		B	J ^π : D 521 γ to (6) ⁺ .
1171.9 3	(1 ⁺)		A	J ^π : log $ft=6.3$ in ε decay from 0 ⁺ parent, 1041 γ to (3 ⁺).
1183.9 5	0,1		A	J ^π : log $ft=6.5$ in ε decay from 0 ⁺ parent.
1184.8 ^a 4	(9 ⁺)		B	J ^π : D 136 γ to (8 ⁺); band assignment.
1316.3 4	(8 ⁺)		B	J ^π : (E2) 722 γ to (6) ⁺ .
1346.4 3	(8 ⁺)		B	J ^π : (E2) 752 γ to (6) ⁺ .
1488.8 3	(0,1) ⁺		A	J ^π : log $ft=6.0$ in ε decay from 0 ⁺ parent, E2 426 γ to (0,1) ⁺ .
1551.4 ^a 4	(10 ⁺)		B	J ^π : D 336.5 γ to (9 ⁺); band assignment.

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Adopted Levels, Gammas (continued) ^{136}Pr Levels (continued)

E(level) [†]	J ^π	XREF	Comments
1802.9 4	(10 ⁺)	B	J ^π : E2 754γ to (8 ⁺).
1837.5 [#] 4	(10 ⁺)	B	J ^π : E2 789γ to (8 ⁺); band assignment.
1911.7 ^a 4	(11 ⁺)	B	J ^π : E2 727γ to (9 ⁺); band assignment.
2102.0 4	(9)	B	J ^π : D 786γ to (8 ⁺); 9 ⁽⁻⁾ proposed in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$.
2152.8 4	(11)	B	J ^π : D 601γ to (10 ⁺); 11 ⁽⁺⁾ proposed in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$.
2222.7 4	(10 ⁺)	B	J ^π : E2 906γ to (8 ⁺).
2235.4 4	(10 ⁺)	B	J ^π : E2 919γ to (8 ⁺).
2265.7 4	(10 ⁺)	B	J ^π : E2 919γ to (8 ⁺).
2332.4 4	(10 ⁺)	B	J ^π : E2 986γ to (8 ⁺).
2382.0 ^a 4	(12 ⁺)	B	J ^π : E2 830γ to (10 ⁺); band assignment.
2444.9 4	(11)	B	J ^π : D 209γ to (10 ⁺).
2465.8 ^d 4	(11)	B	J ^π : D 200γ to (10 ⁺); 11 ⁽⁻⁾ proposed in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$.
2528.6 [#] 4	(12 ⁺)	B	J ^π : E2 691γ to (10 ⁺); band assignment.
2569.1 4	(13)	B	J ^π : E2 416.5γ to (11).
2636.7 4	(12)	B	J ^π : D 484γ to (11).
2680.4 4	(12 ⁺)	B	J ^π : E2 877.5γ to (10 ⁺).
2779.2 ^d 4	(12)	B	J ^π : D313.5γ to (11); band assignment.
2818.8 ^a 5	(13 ⁺)	B	J ^π : E2 907γ to (11 ⁺); band assignment.
2846.8 ^{&} 5	(13 ⁺)	B	J ^π : 935γ to (11 ⁺), D 465γ to (12 ⁺); band assignment.
2919.7 4	(13)	B	J ^π : D 283γ to (12).
3009.8 ^d 4	(13)	B	J ^π : D 231γ to (12); band assignment.
3065.6 5	(14 ⁺)	B	J ^π : E2 684γ to (12 ⁺).
3122.6 [#] 5	(14 ⁺)	B	J ^π : E2 594γ to (12 ⁺); band assignment.
3236.9 ^b 4	(14)	B	J ^π : D 317γ to (13). Proposed as 14 ⁽⁺⁾ bandhead in 1996Pe12.
3314.3 ^{&} 5	(14 ⁺)	B	J ^π : D 467.5γ to (13 ⁺), 932γ to (12 ⁺); band assignment.
3340.6 ^a 5	(14 ⁺)	B	J ^π : E2 958γ to (12 ⁺); band assignment.
3414.7 ^d 5	(14)	B	J ^π : D 405γ to (13); band assignment.
3593.6 ^b 5	(15)	B	J ^π : D 357γ to (14); band assignment.
3677.6 ^d 5	(15)	B	J ^π : D 263γ to (14); band assignment.
3729.0 ^c 4	(14)	B	J ^π : D 719γ to (13).
3783.7 [#] 5	(16 ⁺)	B	J ^π : 661γ to (14 ⁺), band assignment.
3802.0 [@] 7	(15 ⁺)	B	J ^π : E2 955γ to (13 ⁺), band assignment.
3860.7 ^a 5	(15 ⁺)	B	J ^π : E2 1042γ to (13 ⁺), band assignment.
3936.6 ^c 4	(15)	B	J ^π : D 700γ to (14), band assignment.
3998.7 [‡] 7	(15)	B	J ^π : D 876γ to (14 ⁺).
4098.3 ^b 5	(16)	B	J ^π : E2 861γ to (14), band assignment.
4173.1 ^d 5	(16)	B	J ^π : D 495.5γ to (15), band assignment.
4210.2 ^c 5	(16)	B	J ^π : D 274γ to (15), band assignment.
4241.5 ^{&} 6	(16 ⁺)	B	J ^π : 927γ to (14 ⁺), band assignment.
4289.0 5		B	
4355.5 [@] 7	(17 ⁺)	B	J ^π : 553.5γ to (15 ⁺), band assignment.
4411.8 ^a 5	(16 ⁺)	B	J ^π : 551γ to (15 ⁺), 1071.5γ to (14 ⁺), band assignment.
4435.5 ^b 5	(17)	B	J ^π : E2 842γ to (15), band assignment.
4472.7 [#] 6	(18 ⁺)	B	J ^π : E2 689γ to (16 ⁺), band assignment.
4530.0 ^d 5	(17)	B	J ^π : 357γ to (16), band assignment.
4544.0 [‡] 7	(17)	B	J ^π : E2 545γ to (15), band assignment.
4581.1 ^c 5	(17)	B	J ^π : D 371γ to (16), band assignment.
4884.2 ^d 6	(18)	B	J ^π : D 354γ to (17), band assignment.
4958.8 ^a 6	(17 ⁺)	B	J ^π : 547γ to (16 ⁺), 1098γ to (15 ⁺), band assignment.

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Adopted Levels, Gammas (continued) ^{136}Pr Levels (continued)

E(level) [†]	J ^π	XREF	Comments
4990.4 ^c 5	(18)	B	J ^π : D 409γ to (17), 780.5γ to (16), band assignment.
5030.5 ^b 5	(18)	B	J ^π : 595γ to (17), 932γ to (16), band assignment.
5085.6 6	(18)	B	J ^π : D 650γ to (17).
5143.5 [@] 12	(19 ⁺)	B	J ^π : 788γ to (17 ⁺), band assignment.
5175.0 ^{&} 8	(18 ⁺)	B	J ^π : 933.5γ to (16 ⁺), band assignment.
5323.7 ^d 6	(19)	B	J ^π : 439.5γ to (18), band assignment.
5371.1 [#] 8	(20 ⁺)	B	J ^π : 898γ to (18 ⁺), band assignment.
5394.4 [‡] 9	(19)	B	J ^π : E2 850γ to (17), band assignment.
5422.0 ^b 7	(19)	B	J ^π : E2 986.5γ to (17), band assignment.
5430.4 ^c 6	(19)	B	J ^π : E2 849γ to (17), band assignment.
5847.4 ^d 6	(20)	B	J ^π : D 523.7γ to (19), band assignment.
5934.2 ^c 6	(20)	B	J ^π : E2 944γ to (18), band assignment.
6065.7 ^b 7	(20)	B	J ^π : 1035γ to (18), band assignment.
6074.9 ^{&} 9	(20 ⁺)	B	J ^π : E2 900γ to (18 ⁺), band assignment.
6113.0 ^a 7	(19 ⁺)	B	J ^π : 1154γ to (17 ⁺), band assignment.
6426.9 ^d 7	(21)	B	J ^π : D 579.5γ to (20), band assignment.
6444.5 ^c 6	(21)	B	J ^π : D 510γ to (20), 1014γ to (19), band assignment.
6469.6 [‡] 10	(21)	B	J ^π : 1075γ to (19), band assignment.
6470.9 [#] 9	(22 ⁺)	B	J ^π : 1099.7γ to (20 ⁺), band assignment.
6548.2 ^b 9	(21)	B	J ^π : 1126γ to (19), band assignment.
6974.9 ^c 6	(22)	B	J ^π : 530γ to (21), 1040γ to (20), band assignment.
7020.6 ^d 7	(22)	B	J ^π : 594γ to (21), band assignment.
7114.6 ^{&} 10	(22 ⁺)	B	J ^π : 1040γ to (20 ⁺), band assignment.
7561.9 ^c 6	(23)	B	J ^π : 587γ to (22), 1118γ to (21), band assignment.
7727.9 [#] 13	(24 ⁺)	B	J ^π : 1257γ to (22 ⁺), band assignment.
7751.6 [‡] 14	(23)	B	J ^π : 1282γ to (21), band assignment.
7824.2 ^b 13	(23)	B	J ^π : 1276γ to (21), band assignment.

[†] From a least-squares fit to Eγ, by evaluator.[‡] Band(A): Band built on (15), 3999-keV level. Proposed as $\pi h_{11/2} \nu 1/2[530]$ by 1996Pe12.[#] Band(B): $\pi 5/2[413] \nu 1/2[660]$.[@] Band(C): $\pi g_{7/2} (\text{unfavored}) \nu s_{1/2} \nu h_{11/2}^2$.[&] Band(D): $\pi g_{7/2} \nu s_{1/2} \nu h_{11/2}^2$.^a Band(E): $\pi h_{11/2} \nu h_{11/2}$.^b Band(F): Band built on (14), 3237-keV level. Proposed as $\pi h_{11/2} (\alpha=+1/2) \nu h_{11/2}$ by 1996Pe12.^c Band(G): $\pi 5/2[413] \nu 9/2[514] \pi h_{11/2}^2$.^d Band(H): Band built on (11), 2466-keV level. Proposed as $\pi 11/2[505] \nu 1/2[400] \nu h_{11/2}^2$ by 1996Pe12.

Adopted Levels, Gammas (continued)

$\gamma(^{136}\text{Pr})$									
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult. #	$\delta^@$	α	Comments
40.19	1 ⁺ ,2 ⁺	40.2 $\ddagger$ 1	100 $\ddagger$	0.0	2 ⁺	M1+E2	0.040 7	2.85 6	$\alpha(\text{L})=2.25$ 5; $\alpha(\text{M})=0.476$ 11; $\alpha(\text{N})=0.1062$ 23; $\alpha(\text{O})=0.0170$ 4; $\alpha(\text{P})=0.001197$ 19 B(E2)(W.u.)=5.8 21; B(M1)(W.u.)=0.0095 3 Mult.: from $\alpha(\text{L})_{\text{exp}}$ and L sub-shell ratios in ¹³⁶ Nd ε decay.
130.57	(3) ⁺	130.54 $\ddagger$ 13	100 $\ddagger$	0.0	2 ⁺	M1+E2	2.7 18	0.80 10	$\alpha(\text{K})=0.541$ 14; $\alpha(\text{L})=0.20$ 7; $\alpha(\text{M})=0.045$ 15; $\alpha(\text{N})=0.010$ 4; $\alpha(\text{O})=0.0014$ 5; $\alpha(\text{P})=3.1\times 10^{-5}$ 5 Mult., δ : from $\alpha(\text{K})_{\text{exp}}$ and $\alpha(\text{L})_{\text{exp}}$ in ¹³⁶ Nd ε decay. Mult.: other: D from R(DCO) and M1 from intensity balance in ¹¹⁰ Pd(³⁰ Si,p3n γ).
140.69	0 ⁺ ,1 ⁺	100.54 $\ddagger$ 11	100 $\ddagger$	40.19	1 ⁺ ,2 ⁺	M1		1.275	$\alpha(\text{K})=1.086$ 16; $\alpha(\text{L})=0.1498$ 22; $\alpha(\text{M})=0.0316$ 5; $\alpha(\text{N})=0.00706$ 11; $\alpha(\text{O})=0.001136$ 17 $\alpha(\text{P})=8.34\times 10^{-5}$ 12 Mult.: from $\alpha(\text{K})_{\text{exp}}$ and $\alpha(\text{L})_{\text{exp}}$ in ¹³⁶ Nd ε decay.
149.11	1 ⁺	108.90 $\ddagger$ 10	100 $\ddagger$	40.19	1 ⁺ ,2 ⁺	M1+E2	0.21 3	1.039 17	$\alpha(\text{K})=0.868$ 13; $\alpha(\text{L})=0.135$ 5; $\alpha(\text{M})=0.0287$ 11; $\alpha(\text{N})=0.00638$ 24; $\alpha(\text{O})=0.00101$ 4 $\alpha(\text{P})=6.57\times 10^{-5}$ 10 B(E2)(W.u.)>14; B(M1)(W.u.)>0.0085 Mult.: from $\alpha(\text{L})_{\text{exp}}$ and L sub-shell ratios in ¹³⁶ Nd ε decay.
		149.1 $\ddagger$ 1	22.0 $\ddagger$ 20	0.0	2 ⁺	M1		0.419	$\alpha(\text{K})=0.357$ 5; $\alpha(\text{L})=0.0489$ 7; $\alpha(\text{M})=0.01031$ 15; $\alpha(\text{N})=0.00231$ 4; $\alpha(\text{O})=0.000371$ 6 $\alpha(\text{P})=2.74\times 10^{-5}$ 4 B(M1)(W.u.)>0.00077 Mult.: from $\alpha(\text{K})_{\text{exp}}$ and $\alpha(\text{L})_{\text{exp}}$ in ¹³⁶ Nd ε decay.
174.49	(4) ⁻	43.9 2	100	130.57	(3) ⁺	E1		2.26	$\alpha(\text{K})=1.87$ 4; $\alpha(\text{L})=0.312$ 6; $\alpha(\text{M})=0.0656$ 13; $\alpha(\text{N})=0.0142$ 3; $\alpha(\text{O})=0.00210$ 4 $\alpha(\text{P})=0.0001005$ 18 Mult.: from intensity balance in ¹¹⁰ Pd(³⁰ Si,p3n γ).
184.50	1 ⁺	144.28 $\ddagger$ 15	100 $\ddagger$ 15	40.19	1 ⁺ ,2 ⁺	M1(+E2)	0.2 +4-2	0.46 3	$\alpha(\text{K})=0.391$ 6; $\alpha(\text{L})=0.057$ 21; $\alpha(\text{M})=0.012$ 5; $\alpha(\text{N})=0.0027$ 10; $\alpha(\text{O})=0.00043$ 14 $\alpha(\text{P})=2.97\times 10^{-5}$ 18 Mult.: from $\alpha(\text{L})_{\text{exp}}$ in ¹³⁶ Nd ε decay.
		184.5 $\ddagger$ 2	38 $\ddagger$ 8	0.0	2 ⁺	M1		0.232	$\alpha(\text{K})=0.198$ 3; $\alpha(\text{L})=0.0270$ 4; $\alpha(\text{M})=0.00569$ 9; $\alpha(\text{N})=0.001273$ 19; $\alpha(\text{O})=0.000205$ 3 $\alpha(\text{P})=1.515\times 10^{-5}$ 22 Mult.: from $\alpha(\text{L})_{\text{exp}}$ in ¹³⁶ Nd ε decay.
334.70	(1 ⁺)	204.3 $\ddagger$ 5	21 $\ddagger$ 5	130.57	(3) ⁺	(E2)		0.177 3	$\alpha(\text{K})=0.141$ 9; $\alpha(\text{L})=0.027$ 7; $\alpha(\text{M})=0.0059$ 17; $\alpha(\text{N})=0.0013$ 4; $\alpha(\text{O})=0.00020$ 5 $\alpha(\text{P})=9.8\times 10^{-6}$ 17 Mult.: $\alpha(\text{K})_{\text{exp}}$ in ¹³⁶ Nd ε decay gives M1,E2, while decay to (3) ⁺ constrains to E2.
		294.6 $\ddagger$ 2	100 $\ddagger$ 12	40.19	1 ⁺ ,2 ⁺	E2		0.0535	$\alpha(\text{K})=0.0426$ 6; $\alpha(\text{L})=0.00859$ 13; $\alpha(\text{M})=0.00187$ 3; $\alpha(\text{N})=0.000410$ 6; $\alpha(\text{O})=6.16\times 10^{-5}$ 9

$^{136}_{59}\text{Pr}_{77}^{-5}$

From ENSDF

$^{136}_{59}\text{Pr}_{77}^{-5}$

$\alpha(\text{P})=2.77\times 10^{-6}$ 4
Mult.: from $\alpha(\text{K})$ exp in ^{136}Nd ε decay.

Adopted Levels, Gammas (continued)

$\gamma(^{136}\text{Pr})$ (continued)									
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult.#	$\delta^@$	α	Comments
338.43	4 ⁺	207.8 ^a 2 338.5 2	14 ^a 4 100 10	130.57 0.0	(3) ⁺ 2 ⁺	(E2)		0.0348	$\alpha(\text{K})=0.0281$ 4; $\alpha(\text{L})=0.00527$ 8; $\alpha(\text{M})=0.001138$ 17; $\alpha(\text{N})=0.000251$ 4; $\alpha(\text{O})=3.81\times 10^{-5}$ 6 $\alpha(\text{P})=1.87\times 10^{-6}$ 3
351.87		167.4 2 311.7 ^{&} 2	100 10 <150 ^{&}	184.50 40.19	1 ⁺ 1 ⁺ ,2 ⁺				
476.62	1 ⁺	292.4 [‡] 5	16 [‡] 4	184.50	1 ⁺	E2(+M1)	>0.5	0.060 5	$\alpha(\text{K})=0.049$ 6; $\alpha(\text{L})=0.0084$ 5; $\alpha(\text{M})=0.00180$ 12; $\alpha(\text{N})=0.000398$ 24; $\alpha(\text{O})=6.14\times 10^{-5}$ 21 $\alpha(\text{P})=3.4\times 10^{-6}$ 7 Mult.: from $\alpha(\text{K})\text{exp}$ and $\alpha(\text{L})\text{exp}$ in ^{136}Nd ε decay.
		336.0 [‡] 3	38 [‡] 8	140.69	0 ⁺ ,1 ⁺	M1		0.0466	$\alpha(\text{K})=0.0399$ 6; $\alpha(\text{L})=0.00535$ 8; $\alpha(\text{M})=0.001124$ 16; $\alpha(\text{N})=0.000251$ 4; $\alpha(\text{O})=4.06\times 10^{-5}$ 6 $\alpha(\text{P})=3.02\times 10^{-6}$ 5 Mult.: from $\alpha(\text{K})\text{exp}$ in ^{136}Nd ε decay.
		436.5 [‡] 4	15 [‡] 4	40.19	1 ⁺ ,2 ⁺	M1,E2		0.020 4	$\alpha(\text{K})=0.017$ 4; $\alpha(\text{L})=0.00249$ 22; $\alpha(\text{M})=0.00053$ 4; $\alpha(\text{N})=0.000117$ 10; $\alpha(\text{O})=1.86\times 10^{-5}$ 20 $\alpha(\text{P})=1.2\times 10^{-6}$ 3 Mult.: from $\alpha(\text{K})\text{exp}$ in ^{136}Nd ε decay.
		476.7 [‡] 2	100 [‡] 10	0.0	2 ⁺	M1+E2	<0.9	0.0176 14	$\alpha(\text{K})=0.0150$ 13; $\alpha(\text{L})=0.00206$ 10; $\alpha(\text{M})=0.000435$ 20; $\alpha(\text{N})=9.7\times 10^{-5}$ 5; $\alpha(\text{O})=1.56\times 10^{-5}$ 9 $\alpha(\text{P})=1.12\times 10^{-6}$ 12 Mult.: from $\alpha(\text{K})\text{exp}$ and $\alpha(\text{L})\text{exp}$ in ^{136}Nd ε decay.
547.82	(4) ⁺	196.0 2 209.4 ^a 2	2.2 5 6.0 ^a 6	351.87 338.43	4 ⁺	(M1+E2)		0.1635 25	$\alpha(\text{K})=0.132$ 9; $\alpha(\text{L})=0.025$ 6; $\alpha(\text{M})=0.0054$ 15; $\alpha(\text{N})=0.0012$ 3; $\alpha(\text{O})=0.00018$ 4 $\alpha(\text{P})=9.1\times 10^{-6}$ 16 Mult.: D+Q from $\gamma\gamma(\theta)$ in $^{110}\text{Pd}(^{30}\text{Si,p3n}\gamma)$, $\Delta\pi=\text{no}$ from level scheme.
		417.2 2	100 10	130.57	(3) ⁺	M1+E2	+0.11 1	0.0266	$\alpha(\text{K})=0.0227$ 4; $\alpha(\text{L})=0.00303$ 5; $\alpha(\text{M})=0.000638$ 9; $\alpha(\text{N})=0.0001426$ 20; $\alpha(\text{O})=2.30\times 10^{-5}$ 4 $\alpha(\text{P})=1.718\times 10^{-6}$ 25 δ : from $\gamma\gamma(\theta)$ in $^{110}\text{Pd}(^{30}\text{Si,p3n}\gamma)$. Mult.: D+Q from $\gamma\gamma(\theta)$ in $^{110}\text{Pd}(^{30}\text{Si,p3n}\gamma)$, non-zero value of delta favors M1+E2.
574.82	1 ⁺	240.4 [‡] 5	1.5 [‡] 5	334.70	(1 ⁺)	M1,E2 [@]		0.108 6	$\alpha(\text{K})=0.088$ 9; $\alpha(\text{L})=0.016$ 3; $\alpha(\text{M})=0.0034$ 7; $\alpha(\text{N})=0.00074$ 13; $\alpha(\text{O})=0.000114$ 16 $\alpha(\text{P})=6.2\times 10^{-6}$ 12

Adopted Levels, Gammas (continued)

$\gamma(^{136}\text{Pr})$ (continued)									
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult.#	$\delta^@$	α	Comments
574.82	1 ⁺	390.3 $\ddagger$ 2	7.3 $\ddagger$ 13	184.50	1 ⁺	M1,E2 $^@$		0.027 5	$\alpha(\text{K})=0.023$ 5; $\alpha(\text{L})=0.00344$ 19; $\alpha(\text{M})=0.00073$ 3; $\alpha(\text{N})=0.000162$ 8; $\alpha(\text{O})=2.56\times 10^{-5}$ 19 $\alpha(\text{P})=1.7\times 10^{-6}$ 4
		534.9 $\ddagger$ 4	7.0 $\ddagger$ 13	40.19	1 ⁺ ,2 ⁺	E2 $^@$		0.00941	$\alpha(\text{K})=0.00785$ 11; $\alpha(\text{L})=0.001229$ 18; $\alpha(\text{M})=0.000262$ 4; $\alpha(\text{N})=5.81\times 10^{-5}$ 9; $\alpha(\text{O})=9.06\times 10^{-6}$ 13 $\alpha(\text{P})=5.49\times 10^{-7}$ 8
		574.8 $\ddagger$ 1	100 $\ddagger$ 9	0.0	2 ⁺	M1(+E2)	<0.6	0.0114 6	$\alpha(\text{K})=0.0097$ 5; $\alpha(\text{L})=0.00130$ 5; $\alpha(\text{M})=0.000273$ 10; $\alpha(\text{N})=6.10\times 10^{-5}$ 23; $\alpha(\text{O})=9.8\times 10^{-6}$ 4 $\alpha(\text{P})=7.3\times 10^{-7}$ 5
594.60	(6) ⁺	46.8 2	33 3	547.82	(4) ⁺	E2		37.7 9	Mult.: from $\alpha(\text{K})\text{exp}$ and $\alpha(\text{L})\text{exp}$ in ^{136}Nd ε decay. $\alpha(\text{K})=5.59$ 8; $\alpha(\text{L})=25.0$ 7; $\alpha(\text{M})=5.68$ 15; $\alpha(\text{N})=1.22$ 3; $\alpha(\text{O})=0.166$ 5; $\alpha(\text{P})=0.000366$ 6 B(E2)(W.u.)=15.8 21
		420.1 2	100 10	174.49	(4) ⁻	M2		0.0927	Mult.: from intensity balance in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$. $\alpha(\text{K})=0.0775$ 11; $\alpha(\text{L})=0.01193$ 17; $\alpha(\text{M})=0.00255$ 4; $\alpha(\text{N})=0.000571$ 8; $\alpha(\text{O})=9.15\times 10^{-5}$ 13 $\alpha(\text{P})=6.53\times 10^{-6}$ 10 B(M2)(W.u.)=0.071 10 Mult.: Q from $\gamma(\theta)$ in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$, $\Delta\pi=\text{yes}$ from level scheme.
672.79	(1) ⁺	488.6 $\ddagger$ 5	61 $\ddagger$ 17	184.50	1 ⁺	M1,E2 $^@$		0.015 3	$\alpha(\text{K})=0.013$ 3; $\alpha(\text{L})=0.00182$ 22; $\alpha(\text{M})=0.00038$ 5; $\alpha(\text{N})=8.6\times 10^{-5}$ 10; $\alpha(\text{O})=1.36\times 10^{-5}$ 18 $\alpha(\text{P})=9.2\times 10^{-7}$ 24
		523.6 $\ddagger$ 4	61 $\ddagger$ 17	149.11	1 ⁺	M1,E2 $^@$		0.012 3	$\alpha(\text{K})=0.0106$ 23; $\alpha(\text{L})=0.00150$ 20; $\alpha(\text{M})=0.00032$ 4; $\alpha(\text{N})=7.1\times 10^{-5}$ 9; $\alpha(\text{O})=1.13\times 10^{-5}$ 17 $\alpha(\text{P})=7.7\times 10^{-7}$ 20
		632.4 $\ddagger$ 5	89 $\ddagger$ 23	40.19	1 ⁺ ,2 ⁺	E2(+M1) $^@$	≥ 0.7	0.0072 12	$\alpha(\text{K})=0.0061$ 10; $\alpha(\text{L})=0.00087$ 10; $\alpha(\text{M})=0.000183$ 21; $\alpha(\text{N})=4.1\times 10^{-5}$ 5; $\alpha(\text{O})=6.5\times 10^{-6}$ 8 $\alpha(\text{P})=4.5\times 10^{-7}$ 9
		672.4 $\ddagger$ 5	100 $\ddagger$ 23	0.0	2 ⁺	E2(+M1) $^@$	≥ 0.5	0.0064 12	$\alpha(\text{K})=0.0054$ 11; $\alpha(\text{L})=0.00076$ 11; $\alpha(\text{M})=0.000159$ 22; $\alpha(\text{N})=3.6\times 10^{-5}$ 5; $\alpha(\text{O})=5.7\times 10^{-6}$ 9 $\alpha(\text{P})=4.0\times 10^{-7}$ 9
793.3	0 ⁺ ,1 ⁺	219.5 $\ddagger$ ^b 10	12 $\ddagger$ 6	574.82	1 ⁺				
		643.9 $\ddagger$ 4	100 $\ddagger$ 20	149.11	1 ⁺	E2(+M1) $^@$	>0.7	0.0069 11	$\alpha(\text{K})=0.0059$ 10; $\alpha(\text{L})=0.00083$ 10; $\alpha(\text{M})=0.000174$ 20; $\alpha(\text{N})=3.9\times 10^{-5}$ 5; $\alpha(\text{O})=6.2\times 10^{-6}$ 8 $\alpha(\text{P})=4.3\times 10^{-7}$ 8
		652.9 $\ddagger$ 5	67 $\ddagger$ 14	140.69	0 ⁺ ,1 ⁺	M1(+E2) $^@$	≤ 1.6	0.0076 11	$\alpha(\text{K})=0.0065$ 10; $\alpha(\text{L})=0.00088$ 10; $\alpha(\text{M})=0.000185$ 21; $\alpha(\text{N})=4.1\times 10^{-5}$ 5; $\alpha(\text{O})=6.6\times 10^{-6}$ 8 $\alpha(\text{P})=4.8\times 10^{-7}$ 8

Adopted Levels, Gammas (continued)

$\gamma(^{136}\text{Pr})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult. [#]	$\delta^@$	α	Comments
804.0	(7 ⁺)	209.4 2	100	594.60	(6) ⁺	D			
940.09	(1) ⁺	605.7 [‡] 4	94 [‡] 12	334.70	(1) ⁺	M1(+E2) [@]	0.5 +12-5	0.0097 20	$\alpha(\text{K})=0.0083$ 18; $\alpha(\text{L})=0.00112$ 18; $\alpha(\text{M})=0.00023$ 4; $\alpha(\text{N})=5.2\times 10^{-5}$ 8; $\alpha(\text{O})=8.4\times 10^{-6}$ 14 $\alpha(\text{P})=6.2\times 10^{-7}$ 15
		755.2 [‡] 3	85 [‡] 12	184.50	1 ⁺	M1,E2 [@]		0.0051 11	$\alpha(\text{K})=0.0043$ 10; $\alpha(\text{L})=0.00058$ 11; $\alpha(\text{M})=0.000123$ 21; $\alpha(\text{N})=2.7\times 10^{-5}$ 5; $\alpha(\text{O})=4.4\times 10^{-6}$ 8 $\alpha(\text{P})=3.2\times 10^{-7}$ 8
		900.3 [‡] 5	65 [‡] 12	40.19	1 ⁺ ,2 ⁺	E2,M1 [@]		0.0033 7	$\alpha(\text{K})=0.0029$ 6; $\alpha(\text{L})=0.00038$ 7; $\alpha(\text{M})=8.0\times 10^{-5}$ 14; $\alpha(\text{N})=1.8\times 10^{-5}$ 4; $\alpha(\text{O})=2.9\times 10^{-6}$ 6 $\alpha(\text{P})=2.1\times 10^{-7}$ 5
		940.3 [‡] 5	100 [‡] 12	0.0	2 ⁺	E2,(M1) [@]		0.0030 6	$\alpha(\text{K})=0.0026$ 6; $\alpha(\text{L})=0.00034$ 6; $\alpha(\text{M})=7.2\times 10^{-5}$ 13; $\alpha(\text{N})=1.6\times 10^{-5}$ 3; $\alpha(\text{O})=2.6\times 10^{-6}$ 5 $\alpha(\text{P})=1.9\times 10^{-7}$ 5
972.3	(1) ⁺	972.3 [‡] 5	100 [‡]	0.0	2 ⁺	M1,(E2) [@]		0.0028 6	$\alpha(\text{K})=0.0024$ 5; $\alpha(\text{L})=0.00032$ 6; $\alpha(\text{M})=6.7\times 10^{-5}$ 12; $\alpha(\text{N})=1.5\times 10^{-5}$ 3; $\alpha(\text{O})=2.4\times 10^{-6}$ 5 $\alpha(\text{P})=1.8\times 10^{-7}$ 4
∞	(0 ⁺ ,1 ⁺)	528.3 [‡] 5	50 [‡] 16	476.62	1 ⁺				
		855.5 [‡] 5	1.0×10 ² [‡] 4	149.11	1 ⁺	(E2,M1) [@]		0.0038 8	$\alpha(\text{K})=0.0032$ 7; $\alpha(\text{L})=0.00043$ 8; $\alpha(\text{M})=9.0\times 10^{-5}$ 16; $\alpha(\text{N})=2.0\times 10^{-5}$ 4; $\alpha(\text{O})=3.2\times 10^{-6}$ 6 $\alpha(\text{P})=2.4\times 10^{-7}$ 6
1048.8	(8 ⁺)	244.8 2	100	804.0	(7 ⁺)	D			
1062.6	(0,1) ⁺	921.9 [‡] 5	94 [‡] 24	140.69	0 ⁺ ,1 ⁺	E2,M1 [@]		0.0032 7	$\alpha(\text{K})=0.0027$ 6; $\alpha(\text{L})=0.00036$ 7; $\alpha(\text{M})=7.6\times 10^{-5}$ 13; $\alpha(\text{N})=1.7\times 10^{-5}$ 3; $\alpha(\text{O})=2.7\times 10^{-6}$ 5 $\alpha(\text{P})=2.0\times 10^{-7}$ 5
		1021.5 [‡] 5	100 [‡] 24	40.19	1 ⁺ ,2 ⁺				
		1062.5 [‡] 6	76 [‡] 18	0.0	2 ⁺				
1116.0	(7)	521.4 2	100	594.60	(6) ⁺	D			
1171.9	(1 ⁺)	498.7 [‡] 5	8.×10 ¹ [‡] 3	672.79	(1) ⁺				
		1031.5 [‡] 5	80 [‡] 20	140.69	0 ⁺ ,1 ⁺				
		1041.4 [‡] 6	100 [‡] 20	130.57	(3) ⁺				
1183.9	0,1	211.6 ^{‡b} 5	56 [‡] 17	972.3	(1) ⁺				
		1184.0 [‡] 8	1.0×10 ² [‡] 3	0.0	2 ⁺				
1184.8	(9 ⁺)	136.0 2	100	1048.8	(8 ⁺)	(M1)		0.542	$\alpha(\text{K})=0.462$ 7; $\alpha(\text{L})=0.0634$ 10; $\alpha(\text{M})=0.01336$ 20; $\alpha(\text{N})=0.00299$ 5; $\alpha(\text{O})=0.000481$ 7 $\alpha(\text{P})=3.54\times 10^{-5}$ 6 Mult.: D from R(DCO) and $\gamma(\theta)$ in ¹¹⁰ Pd(³⁰ Si,p3ny), (M1) from placement in band sequence.
1316.3	(8 ⁺)	721.7 5	100	594.60	(6) ⁺	(E2)		0.00443	$\alpha(\text{K})=0.00375$ 6; $\alpha(\text{L})=0.000541$ 8; $\alpha(\text{M})=0.0001146$

Adopted Levels, Gammas (continued)

$\gamma(^{136}\text{Pr})$ (continued)								
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult. [#]	α	Comments
								$17; \alpha(\text{N})=2.55\times 10^{-5} \text{ } 4; \alpha(\text{O})=4.03\times 10^{-6} \text{ } 6$ $\alpha(\text{P})=2.67\times 10^{-7} \text{ } 4$
1346.4	(8 ⁺)	230.3 ² 751.8 ⁵	41 ⁶ 100 ⁵	1116.0 (7) 594.60 (6) ⁺		(E2)	0.00403	$\alpha(\text{K})=0.00341 \text{ } 5; \alpha(\text{L})=0.000488 \text{ } 7; \alpha(\text{M})=0.0001032 \text{ } 15; \alpha(\text{N})=2.30\times 10^{-5} \text{ } 4;$ $\alpha(\text{O})=3.63\times 10^{-6} \text{ } 6$ $\alpha(\text{P})=2.43\times 10^{-7} \text{ } 4$
1488.8	(0,1) ⁺	425.9 [‡] ³	75 [‡] ¹³	1062.6 (0,1) ⁺		E2 [@]	0.01762	$\alpha(\text{K})=0.01450 \text{ } 21; \alpha(\text{L})=0.00246 \text{ } 4; \alpha(\text{M})=0.000528 \text{ } 8; \alpha(\text{N})=0.0001166 \text{ } 17;$ $\alpha(\text{O})=1.80\times 10^{-5} \text{ } 3$ $\alpha(\text{P})=9.93\times 10^{-7} \text{ } 14$
1551.4	(10 ⁺)	1013.1 [‡] ⁵ 1489.0 [‡] ⁷ 366.5 ²	100 [‡] ²⁵ $9.\times 10^1$ [‡] ³ 100	476.62 1 ⁺ 0.0 2 ⁺ 1184.8 (9 ⁺)		(M1)	0.0372	$\alpha(\text{K})=0.0318 \text{ } 5; \alpha(\text{L})=0.00426 \text{ } 6; \alpha(\text{M})=0.000894 \text{ } 13; \alpha(\text{N})=0.000200 \text{ } 3;$ $\alpha(\text{O})=3.23\times 10^{-5} \text{ } 5$ $\alpha(\text{P})=2.41\times 10^{-6} \text{ } 4$ Mult.: D from R(DCO) and $\gamma(\theta)$ in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$, (M1) from placement in band sequence.
1802.9	(10 ⁺)	618.2 ²	100 ¹⁰	1184.8 (9 ⁺)		(M1)	0.00996	$\alpha(\text{K})=0.00854 \text{ } 12; \alpha(\text{L})=0.001121 \text{ } 16; \alpha(\text{M})=0.000235 \text{ } 4; \alpha(\text{N})=5.26\times 10^{-5} \text{ } 8;$ $\alpha(\text{O})=8.51\times 10^{-6} \text{ } 12$ $\alpha(\text{P})=6.41\times 10^{-7} \text{ } 9$ Mult.: D from $\gamma(\theta)$ in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$, $\Delta\pi=\text{no}$ from level scheme.
		754.4 ⁵	92 ⁵	1048.8 (8 ⁺)		E2	0.00399	$\alpha(\text{K})=0.00338 \text{ } 5; \alpha(\text{L})=0.000484 \text{ } 7; \alpha(\text{M})=0.0001023 \text{ } 15; \alpha(\text{N})=2.28\times 10^{-5} \text{ } 4;$ $\alpha(\text{O})=3.60\times 10^{-6} \text{ } 5$ $\alpha(\text{P})=2.41\times 10^{-7} \text{ } 4$
1837.5	(10 ⁺)	652.7 ²	58 ⁴	1184.8 (9 ⁺)		(M1)	0.00872	$\alpha(\text{K})=0.00748 \text{ } 11; \alpha(\text{L})=0.000980 \text{ } 14; \alpha(\text{M})=0.000206 \text{ } 3; \alpha(\text{N})=4.60\times 10^{-5} \text{ } 7;$ $\alpha(\text{O})=7.44\times 10^{-6} \text{ } 11$ $\alpha(\text{P})=5.61\times 10^{-7} \text{ } 8$ Mult.: D from $\gamma(\theta)$ in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$, $\Delta\pi=\text{no}$ from level scheme.
		788.9 ⁵	100 ⁴	1048.8 (8 ⁺)		E2	0.00360	$\alpha(\text{K})=0.00305 \text{ } 5; \alpha(\text{L})=0.000432 \text{ } 6; \alpha(\text{M})=9.14\times 10^{-5} \text{ } 13; \alpha(\text{N})=2.03\times 10^{-5} \text{ } 3;$ $\alpha(\text{O})=3.22\times 10^{-6} \text{ } 5$ $\alpha(\text{P})=2.18\times 10^{-7} \text{ } 3$
1911.7	(11 ⁺)	360.2 ²	95.0 ¹⁷	1551.4 (10 ⁺)		(M1)	0.0389	$\alpha(\text{K})=0.0333 \text{ } 5; \alpha(\text{L})=0.00445 \text{ } 7; \alpha(\text{M})=0.000936 \text{ } 14; \alpha(\text{N})=0.000209 \text{ } 3;$ $\alpha(\text{O})=3.38\times 10^{-5} \text{ } 5$ $\alpha(\text{P})=2.52\times 10^{-6} \text{ } 4$ Mult.: D from $\gamma(\theta)$ in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$, $\Delta\pi=\text{no}$ from level scheme.
		726.6 ⁵	100 ¹¹	1184.8 (9 ⁺)		E2	0.00436	$\alpha(\text{K})=0.00369 \text{ } 6; \alpha(\text{L})=0.000532 \text{ } 8; \alpha(\text{M})=0.0001126 \text{ } 16; \alpha(\text{N})=2.50\times 10^{-5} \text{ } 4;$ $\alpha(\text{O})=3.96\times 10^{-6} \text{ } 6$ $\alpha(\text{P})=2.63\times 10^{-7} \text{ } 4$
2102.0	(9)	785.9 ⁵	100	1316.3 (8 ⁺)		D		
2152.8	(11)	350.0 ² 601.4 ²	20 ³ 100 ¹²	1802.9 (10 ⁺) 1551.4 (10 ⁺)		D D		
2222.7	(10 ⁺)	906.3 ⁵	100	1316.3 (8 ⁺)		E2	0.00263	$\alpha(\text{K})=0.00224 \text{ } 4; \alpha(\text{L})=0.000309 \text{ } 5; \alpha(\text{M})=6.52\times 10^{-5} \text{ } 10; \alpha(\text{N})=1.452\times 10^{-5}$

Adopted Levels, Gammas (continued)

$\gamma(^{136}\text{Pr})$ (continued)								
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult.#	α	Comments
2235.4	(10 ⁺)	133.4 ^a 2	20.0 ^a 12	2102.0 (9)	(M1)		0.572	21; $\alpha(\text{O})=2.31\times 10^{-6}$ 4 $\alpha(\text{P})=1.607\times 10^{-7}$ 23 $\alpha(\text{K})=0.487$ 8; $\alpha(\text{L})=0.0669$ 10; $\alpha(\text{M})=0.01411$ 21; $\alpha(\text{N})=0.00316$ 5; $\alpha(\text{O})=0.000508$ 8 $\alpha(\text{P})=3.74\times 10^{-5}$ 6 Mult.: D from R(DCO) in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$; $\Delta\pi=\text{no}$ from level scheme.
		919.0 5	100 8	1316.3 (8 ⁺)	E2		0.00255	$\alpha(\text{K})=0.00217$ 3; $\alpha(\text{L})=0.000299$ 5; $\alpha(\text{M})=6.31\times 10^{-5}$ 9; $\alpha(\text{N})=1.406\times 10^{-5}$ 20; $\alpha(\text{O})=2.24\times 10^{-6}$ 4 $\alpha(\text{P})=1.560\times 10^{-7}$ 22
2265.7	(10 ⁺)	919.3 5	100	1346.4 (8 ⁺)	E2		0.00255	$\alpha(\text{K})=0.00217$ 3; $\alpha(\text{L})=0.000299$ 5; $\alpha(\text{M})=6.30\times 10^{-5}$ 9; $\alpha(\text{N})=1.404\times 10^{-5}$ 20; $\alpha(\text{O})=2.24\times 10^{-6}$ 4 $\alpha(\text{P})=1.559\times 10^{-7}$ 22
2332.4	(10 ⁺)	985.9 5	100	1346.4 (8 ⁺)	E2		0.00219	$\alpha(\text{K})=0.00187$ 3; $\alpha(\text{L})=0.000255$ 4; $\alpha(\text{M})=5.36\times 10^{-5}$ 8; $\alpha(\text{N})=1.194\times 10^{-5}$ 17; $\alpha(\text{O})=1.91\times 10^{-6}$ 3 $\alpha(\text{P})=1.343\times 10^{-7}$ 19
2382.0	(12 ⁺)	470.4 2	100 3	1911.7 (11 ⁺)	(M1)		0.0197	$\alpha(\text{K})=0.01684$ 24; $\alpha(\text{L})=0.00223$ 4; $\alpha(\text{M})=0.000469$ 7; $\alpha(\text{N})=0.0001049$ 15 $\alpha(\text{O})=1.694\times 10^{-5}$ 24; $\alpha(\text{P})=1.271\times 10^{-6}$ 18 Mult.: D from R(DCO) and $\gamma(\theta)$ in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$; $\Delta\pi=\text{no}$ from level scheme.
		830.4 5	27 3	1551.4 (10 ⁺)	E2		0.00320	$\alpha(\text{K})=0.00272$ 4; $\alpha(\text{L})=0.000381$ 6; $\alpha(\text{M})=8.05\times 10^{-5}$ 12; $\alpha(\text{N})=1.79\times 10^{-5}$ 3; $\alpha(\text{O})=2.85\times 10^{-6}$ 4 $\alpha(\text{P})=1.95\times 10^{-7}$ 3
2444.9	(11)	209.4 2	100	2235.4 (10 ⁺)	D			
2465.8	(11)	133.4 ^a 2	56 ^a 3	2332.4 (10 ⁺)				
		200.1 2	100 8	2265.7 (10 ⁺)	D			
		230.5 2	70 11	2235.4 (10 ⁺)				
		243.1 2	78 4	2222.7 (10 ⁺)				
2528.6	(12 ⁺)	617 1	<12	1911.7 (11 ⁺)				
		691.1 2	100 9	1837.5 (10 ⁺)	E2		0.00492	$\alpha(\text{K})=0.00415$ 6; $\alpha(\text{L})=0.000606$ 9; $\alpha(\text{M})=0.0001283$ 18; $\alpha(\text{N})=2.85\times 10^{-5}$ 4; $\alpha(\text{O})=4.50\times 10^{-6}$ 7 $\alpha(\text{P})=2.95\times 10^{-7}$ 5
2569.1	(13)	416.5 2	100 8	2152.8 (11)	E2		0.0188	$\alpha(\text{K})=0.01543$ 22; $\alpha(\text{L})=0.00264$ 4; $\alpha(\text{M})=0.000567$ 8; $\alpha(\text{N})=0.0001253$ 18; $\alpha(\text{O})=1.93\times 10^{-5}$ 3 $\alpha(\text{P})=1.054\times 10^{-6}$ 15
2636.7	(12)	657.2 2	25.8 24	1911.7 (11 ⁺)				
2680.4	(12 ⁺)	483.9 2	100	2152.8 (11)	D			
		527.7 2	60 8	2152.8 (11)	D			
		768.5 5	35 4	1911.7 (11 ⁺)				
		877.5 5	100 21	1802.9 (10 ⁺)	E2		0.00283	$\alpha(\text{K})=0.00241$ 4; $\alpha(\text{L})=0.000334$ 5; $\alpha(\text{M})=7.04\times 10^{-5}$ 10; $\alpha(\text{N})=1.568\times 10^{-5}$ 22; $\alpha(\text{O})=2.50\times 10^{-6}$ 4 $\alpha(\text{P})=1.724\times 10^{-7}$ 25
2779.2	(12)	313.5 2	100.0 8	2465.8 (11)	D			

Adopted Levels, Gammas (continued)

$\gamma(^{136}\text{Pr})$ (continued)									
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult. #	α	Comments	
2779.2	(12)	334.2 2	35.2 8	2444.9	(11)	D			
2818.8	(13 ⁺)	436.8 2	52 4	2382.0	(12 ⁺)	(M1)	0.0237	$\alpha(\text{K})=0.0203$ 3; $\alpha(\text{L})=0.00270$ 4; $\alpha(\text{M})=0.000567$ 8; $\alpha(\text{N})=0.0001269$ 18; $\alpha(\text{O})=2.05\times 10^{-5}$ 3 $\alpha(\text{P})=1.535\times 10^{-6}$ 22	
		907.1 5	100 10	1911.7	(11 ⁺)	E2	0.00263	Mult.: D from R(DCO) in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$, $\Delta\pi=\text{no}$ from level scheme. $\alpha(\text{K})=0.00224$ 4; $\alpha(\text{L})=0.000309$ 5; $\alpha(\text{M})=6.51\times 10^{-5}$ 10; $\alpha(\text{N})=1.449\times 10^{-5}$ 21; $\alpha(\text{O})=2.31\times 10^{-6}$ 4 $\alpha(\text{P})=1.604\times 10^{-7}$ 23	
2846.8	(13 ⁺)	464.7 2	100 10	2382.0	(12 ⁺)	(M1)	0.0203	$\alpha(\text{K})=0.01737$ 25; $\alpha(\text{L})=0.00230$ 4; $\alpha(\text{M})=0.000484$ 7; $\alpha(\text{N})=0.0001082$ 16 $\alpha(\text{O})=1.748\times 10^{-5}$ 25; $\alpha(\text{P})=1.311\times 10^{-6}$ 19 Mult.: D from R(DCO) in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$, $\Delta\pi=\text{no}$ from level scheme.	
2919.7	(13)	935.3 5 239.4 2 283.0 2 350.6 2 539 1	70 7 100 6 45.5 20 91 14 <10	1911.7 (11 ⁺) 2680.4 (12 ⁺) 2636.7 (12) 2569.1 (13) 2382.0 (12 ⁺)		D D D			
3009.8	(13)	230.6 2	100	2779.2	(12)	D			
3065.6	(14 ⁺)	683.6 2	100	2382.0	(12 ⁺)	E2	0.00505	$\alpha(\text{K})=0.00426$ 6; $\alpha(\text{L})=0.000623$ 9; $\alpha(\text{M})=0.0001321$ 19; $\alpha(\text{N})=2.94\times 10^{-5}$ 5; $\alpha(\text{O})=4.63\times 10^{-6}$ 7 $\alpha(\text{P})=3.03\times 10^{-7}$ 5	
3122.6	(14 ⁺)	594.0 2	100	2528.6	(12 ⁺)	E2	0.00716	$\alpha(\text{K})=0.00601$ 9; $\alpha(\text{L})=0.000912$ 13; $\alpha(\text{M})=0.000194$ 3; $\alpha(\text{N})=4.30\times 10^{-5}$ 6; $\alpha(\text{O})=6.75\times 10^{-6}$ 10 $\alpha(\text{P})=4.23\times 10^{-7}$ 6	
3236.9	(14)	317.1 2	100	2919.7	(13)	D			
3314.3	(14 ⁺)	467.5 2	100 20	2846.8	(13 ⁺)	(M1)	0.0200	$\alpha(\text{K})=0.01711$ 24; $\alpha(\text{L})=0.00227$ 4; $\alpha(\text{M})=0.000476$ 7; $\alpha(\text{N})=0.0001066$ 15 $\alpha(\text{O})=1.721\times 10^{-5}$ 25; $\alpha(\text{P})=1.291\times 10^{-6}$ 19 Mult.: D from R(DCO) in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$, $\Delta\pi=\text{no}$ from level scheme.	
3340.6	(14 ⁺)	932.2 5 521.8 2	39 6 100 22	2382.0 (12 ⁺) 2818.8 (13 ⁺)		(M1)	0.01516	$\alpha(\text{K})=0.01299$ 19; $\alpha(\text{L})=0.001715$ 24; $\alpha(\text{M})=0.000360$ 5; $\alpha(\text{N})=8.06\times 10^{-5}$ 12 $\alpha(\text{O})=1.302\times 10^{-5}$ 19; $\alpha(\text{P})=9.78\times 10^{-7}$ 14	
		958.2 5	94 16	2382.0	(12 ⁺)	E2	0.00233	Mult.: D from R(DCO) in $^{110}\text{Pd}(^{30}\text{Si},\text{p}3\text{n}\gamma)$, $\Delta\pi=\text{no}$ from level scheme. $\alpha(\text{K})=0.00199$ 3; $\alpha(\text{L})=0.000272$ 4; $\alpha(\text{M})=5.72\times 10^{-5}$ 8; $\alpha(\text{N})=1.275\times 10^{-5}$ 18; $\alpha(\text{O})=2.03\times 10^{-6}$ 3 $\alpha(\text{P})=1.427\times 10^{-7}$ 20	
3414.7	(14)	404.9 2	100	3009.8	(13)	D			
3593.6	(15)	356.7 2	100	3236.9	(14)	D			
3677.6	(15)	262.9 2	100	3414.7	(14)	D			
3729.0	(14)	719.0 5 810.0 5	100 9 55 6	3009.8 (13) 2919.7 (13)		D D			
3783.7	(16 ⁺)	661.1 2	100	3122.6	(14 ⁺)				
3802.0	(15 ⁺)	955.2 5	100	2846.8	(13 ⁺)	E2	0.00235	$\alpha(\text{K})=0.00200$ 3; $\alpha(\text{L})=0.000274$ 4; $\alpha(\text{M})=5.76\times 10^{-5}$ 8; $\alpha(\text{N})=1.284\times 10^{-5}$ 18;	

Adopted Levels, Gammas (continued)

$\gamma(^{136}\text{Pr})$ (continued)									
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult.#	α	Comments	
								$\alpha(\text{O})=2.05\times 10^{-6}$ 3 $\alpha(\text{P})=1.436\times 10^{-7}$ 21	
3860.7	(15 ⁺)	520.1 2 1042.1 5	35 5 100 5	3340.6 (14 ⁺) 2818.8 (13 ⁺)		E2	0.00195	$\alpha(\text{K})=0.001664$ 24; $\alpha(\text{L})=0.000225$ 4; $\alpha(\text{M})=4.72\times 10^{-5}$ 7; $\alpha(\text{N})=1.053\times 10^{-5}$ 15 $\alpha(\text{O})=1.684\times 10^{-6}$ 24; $\alpha(\text{P})=1.196\times 10^{-7}$ 17	
3936.6	(15)	207.8 ^a 2 699.6 2	100 ^a 4 51 4	3729.0 (14) 3236.9 (14)		D D			
3998.7	(15)	876.1 5	100	3122.6 (14 ⁺)		D			
4098.3	(16)	504.7 2 861.4 5	100 6 90 6	3593.6 (15) 3236.9 (14)		D E2	0.00295	$\alpha(\text{K})=0.00251$ 4; $\alpha(\text{L})=0.000349$ 5; $\alpha(\text{M})=7.36\times 10^{-5}$ 11; $\alpha(\text{N})=1.639\times 10^{-5}$ 23; $\alpha(\text{O})=2.61\times 10^{-6}$ 4 $\alpha(\text{P})=1.79\times 10^{-7}$ 3	
4173.1	(16)	495.5 2	100	3677.6 (15)		D			
4210.2	(16)	273.6 2	100	3936.6 (15)		D			
4241.5	(16 ⁺)	901.0 5 927.2 5	61 9 100 9	3340.6 (14 ⁺) 3314.3 (14 ⁺)					
4289.0		611.3 2	100	3677.6 (15)					
4355.5	(17 ⁺)	553.5 2	100	3802.0 (15 ⁺)					
4411.8	(16 ⁺)	551.1 2 1071.5 5	95 11 100 16	3860.7 (15 ⁺) 3340.6 (14 ⁺)					
4435.5	(17)	337.2 2 841.7 5	56.9 20 100 7	4098.3 (16) 3593.6 (15)		D E2	0.00311	$\alpha(\text{K})=0.00264$ 4; $\alpha(\text{L})=0.000369$ 6; $\alpha(\text{M})=7.79\times 10^{-5}$ 11; $\alpha(\text{N})=1.734\times 10^{-5}$ 25; $\alpha(\text{O})=2.76\times 10^{-6}$ 4 $\alpha(\text{P})=1.89\times 10^{-7}$ 3	
4472.7	(18 ⁺)	689.0 2	100	3783.7 (16 ⁺)		E2	0.00496	$\alpha(\text{K})=0.00418$ 6; $\alpha(\text{L})=0.000611$ 9; $\alpha(\text{M})=0.0001294$ 19; $\alpha(\text{N})=2.88\times 10^{-5}$ 4; $\alpha(\text{O})=4.54\times 10^{-6}$ 7 $\alpha(\text{P})=2.97\times 10^{-7}$ 5	
4530.0	(17)	241.0 2 357.0 2	87 12 100 4	4289.0 4173.1 (16)					
4544.0	(17)	545.3 2	100	3998.7 (15)		E2	0.00894	$\alpha(\text{K})=0.00747$ 11; $\alpha(\text{L})=0.001162$ 17; $\alpha(\text{M})=0.000248$ 4; $\alpha(\text{N})=5.49\times 10^{-5}$ 8; $\alpha(\text{O})=8.57\times 10^{-6}$ 12 $\alpha(\text{P})=5.23\times 10^{-7}$ 8	
4581.1	(17)	370.8 2	100	4210.2 (16)		D			
4884.2	(18)	354.2 2	100	4530.0 (17)		D			
4958.8	(17 ⁺)	547.0 2 1098.0 5	46 4 100 11	4411.8 (16 ⁺) 3860.7 (15 ⁺)					
4990.4	(18)	409.2 2 780.5 5	100 3 20.2 17	4581.1 (17) 4210.2 (16)		D			
5030.5	(18)	595.0 2 932.3 5	75 13 100 13	4435.5 (17) 4098.3 (16)					
5085.6	(18)	650.1 2	100	4435.5 (17)		D			
5143.5	(19 ⁺)	788 1	100	4355.5 (17 ⁺)					

Adopted Levels, Gammas (continued)

$\gamma(^{136}\text{Pt})$ (continued)									
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult.#	α	Comments	
5175.0	(18 ⁺)	933.5 5	100	4241.5	(16 ⁺)				
5323.7	(19)	439.5 2	100	4884.2	(18)				
5371.1	(20 ⁺)	898.4 5	100	4472.7	(18 ⁺)				
5394.4	(19)	850.4 5	100	4544.0	(17)	E2	0.00303	$\alpha(\text{K})=0.00258$ 4; $\alpha(\text{L})=0.000360$ 5; $\alpha(\text{M})=7.59\times 10^{-5}$ 11; $\alpha(\text{N})=1.691\times 10^{-5}$ 24; $\alpha(\text{O})=2.69\times 10^{-6}$ 4 $\alpha(\text{P})=1.85\times 10^{-7}$ 3	
5422.0	(19)	986.5 5	100	4435.5	(17)	E2	0.00219	$\alpha(\text{K})=0.00187$ 3; $\alpha(\text{L})=0.000254$ 4; $\alpha(\text{M})=5.35\times 10^{-5}$ 8; $\alpha(\text{N})=1.193\times 10^{-5}$ 17; $\alpha(\text{O})=1.90\times 10^{-6}$ 3 $\alpha(\text{P})=1.342\times 10^{-7}$ 19	
5430.4	(19)	440.0 2	100 8	4990.4	(18)	D			
		849.3 5	49 5	4581.1	(17)	E2	0.00304	$\alpha(\text{K})=0.00259$ 4; $\alpha(\text{L})=0.000361$ 5; $\alpha(\text{M})=7.62\times 10^{-5}$ 11; $\alpha(\text{N})=1.696\times 10^{-5}$ 24; $\alpha(\text{O})=2.70\times 10^{-6}$ 4 $\alpha(\text{P})=1.85\times 10^{-7}$ 3	
5847.4	(20)	523.7 2	100	5323.7	(19)	D			
5934.2	(20)	503.7 2	100 8	5430.4	(19)	D			
		943.9 5	42 4	4990.4	(18)	E2	0.00241	$\alpha(\text{K})=0.00205$ 3; $\alpha(\text{L})=0.000281$ 4; $\alpha(\text{M})=5.92\times 10^{-5}$ 9; $\alpha(\text{N})=1.320\times 10^{-5}$ 19; $\alpha(\text{O})=2.11\times 10^{-6}$ 3 $\alpha(\text{P})=1.473\times 10^{-7}$ 21	
6065.7	(20)	1035.2 5	100	5030.5	(18)				
6074.9	(20 ⁺)	899.9 5	100	5175.0	(18 ⁺)	E2	0.00267	$\alpha(\text{K})=0.00228$ 4; $\alpha(\text{L})=0.000315$ 5; $\alpha(\text{M})=6.63\times 10^{-5}$ 10; $\alpha(\text{N})=1.477\times 10^{-5}$ 21; $\alpha(\text{O})=2.35\times 10^{-6}$ 4 $\alpha(\text{P})=1.632\times 10^{-7}$ 23	
6113.0	(19 ⁺)	1154.2 5	100	4958.8	(17 ⁺)				
6426.9	(21)	579.5 2	100	5847.4	(20)	D			
6444.5	(21)	510.3 2	100 8	5934.2	(20)	D			
		1014.2 2	78 7	5430.4	(19)				
6469.6	(21)	1075.1 5	100	5394.4	(19)				
6470.9	(22 ⁺)	1099.7 5	100	5371.1	(20 ⁺)				
6548.2	(21)	1126.2 5	100	5422.0	(19)				
6974.9	(22)	530.4 2	100 14	6444.5	(21)				
		1040.0 5	51 8	5934.2	(20)				
7020.6	(22)	593.7 2	100	6426.9	(21)				
7114.6	(22 ⁺)	1039.7 5	100	6074.9	(20 ⁺)				
7561.9	(23)	587.0 2	70 15	6974.9	(22)				
		1117.8 5	100 15	6444.5	(21)				
7727.9	(24 ⁺)	1257 1	100	6470.9	(22 ⁺)				
7751.6	(23)	1282 1	100	6469.6	(21)				
7824.2	(23)	1276 1	100	6548.2	(21)				

[†] From ¹¹⁰Pd(³⁰Si,p3n γ), except where noted.

Adopted Levels, Gammas (continued)

$\gamma(^{136}\text{Pt})$ (continued)

‡ From ¹³⁶Nd ε decay.

From R(DCO) and $\gamma(\theta)$ in ¹¹⁰Pd(³⁰Si,p3n γ), except where noted. Stretched Q transitions are assumed E2 in character.

@ From α (exp) and L subshell ratios in ¹³⁶Nd ε decay.

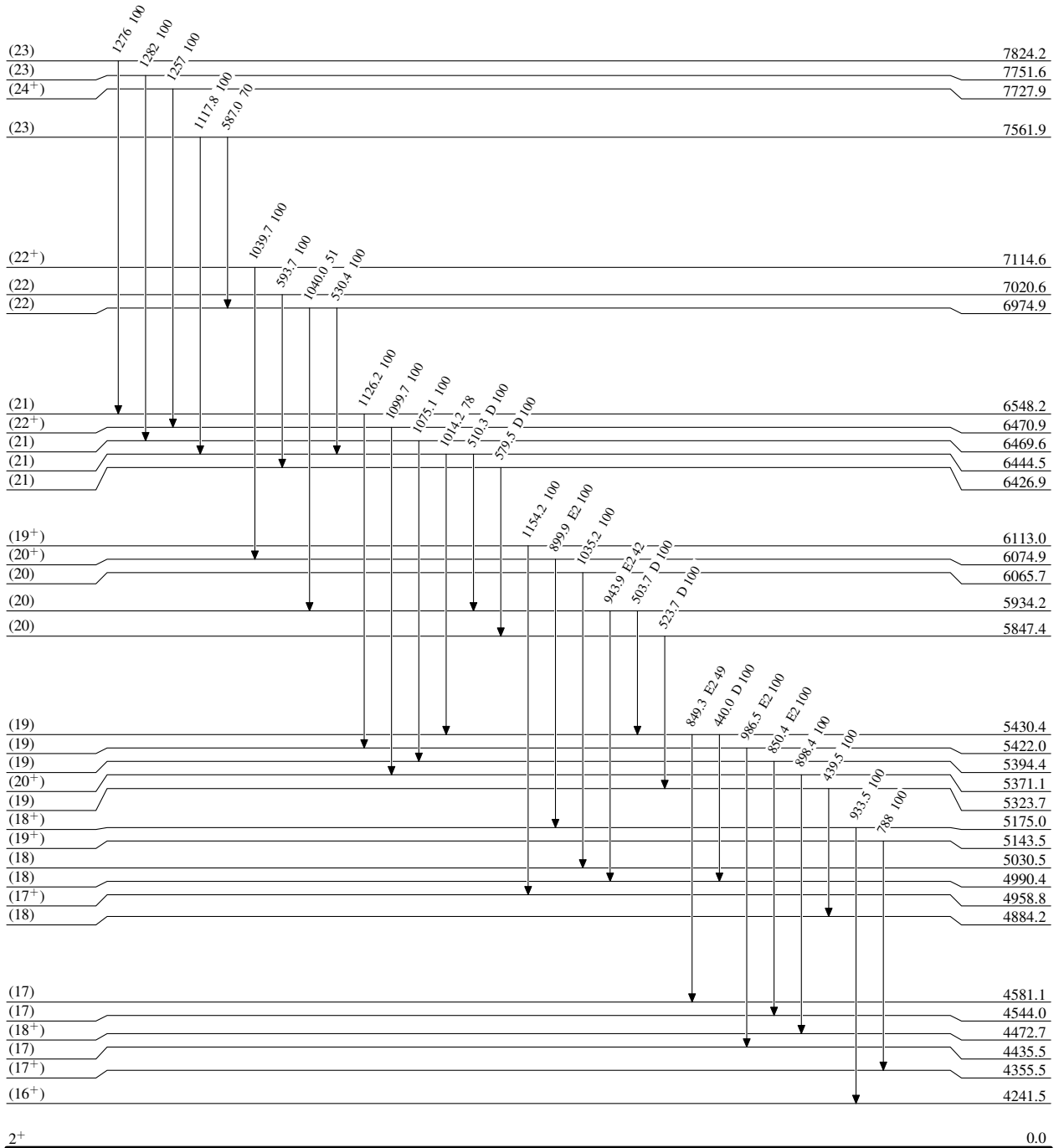
& Multiply placed with undivided intensity.

^a Multiply placed with intensity suitably divided.

^b Placement of transition in the level scheme is uncertain.

Adopted Levels, GammasLevel Scheme

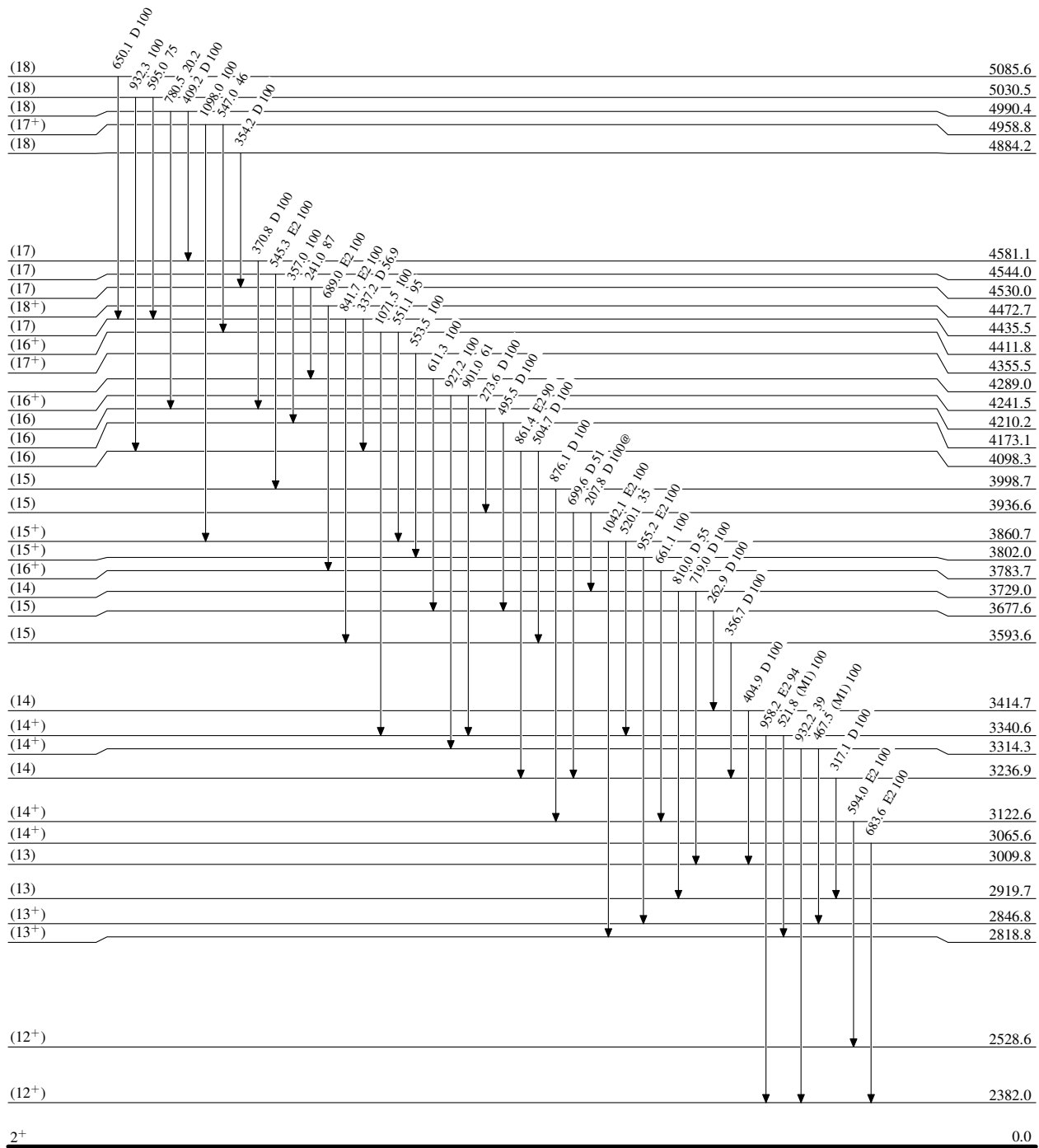
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

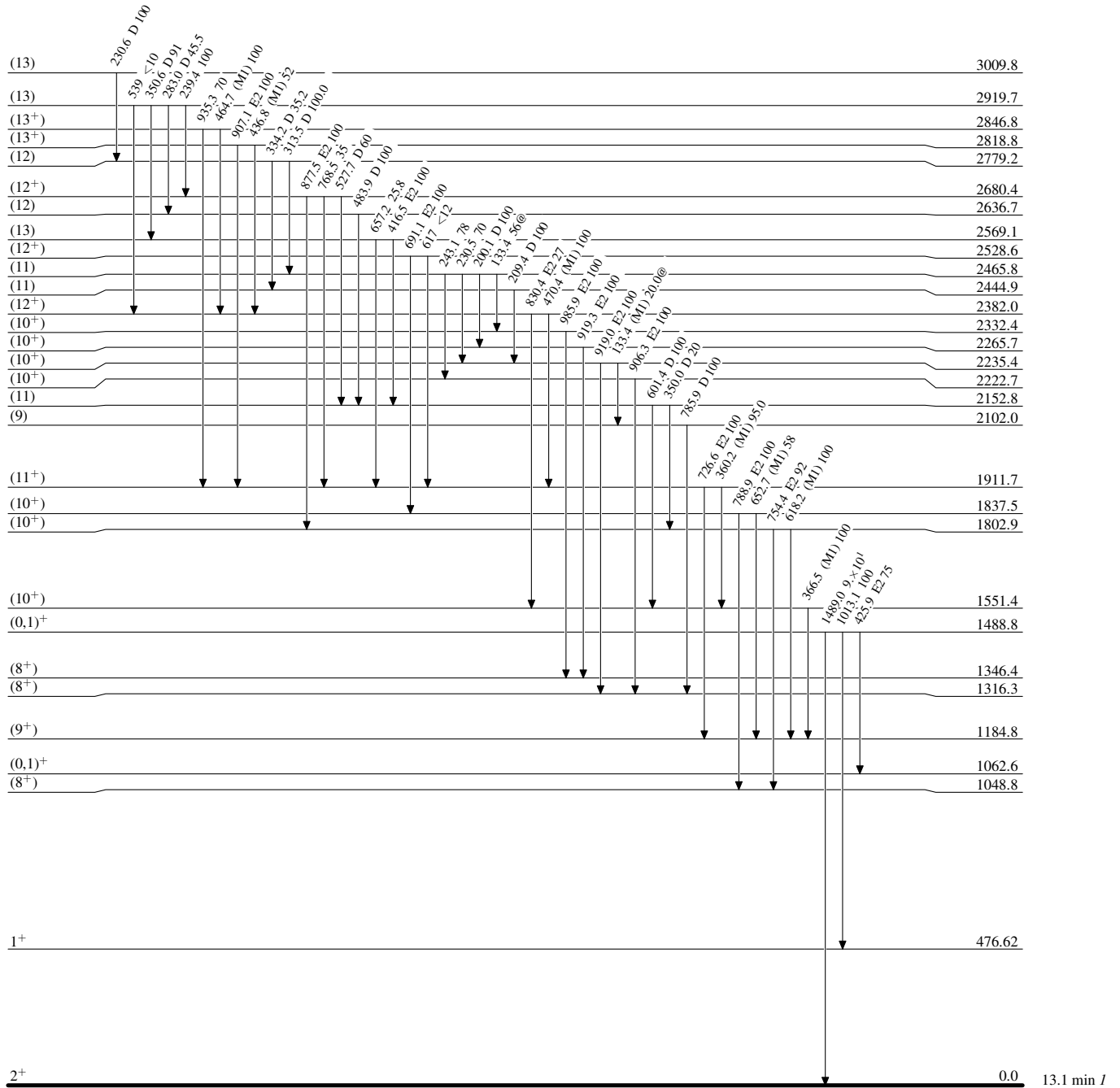
Intensities: Relative photon branching from each level
@ Multiplied: intensity suitably divided



13.1 min /

Adopted Levels, Gammas**Level Scheme (continued)**

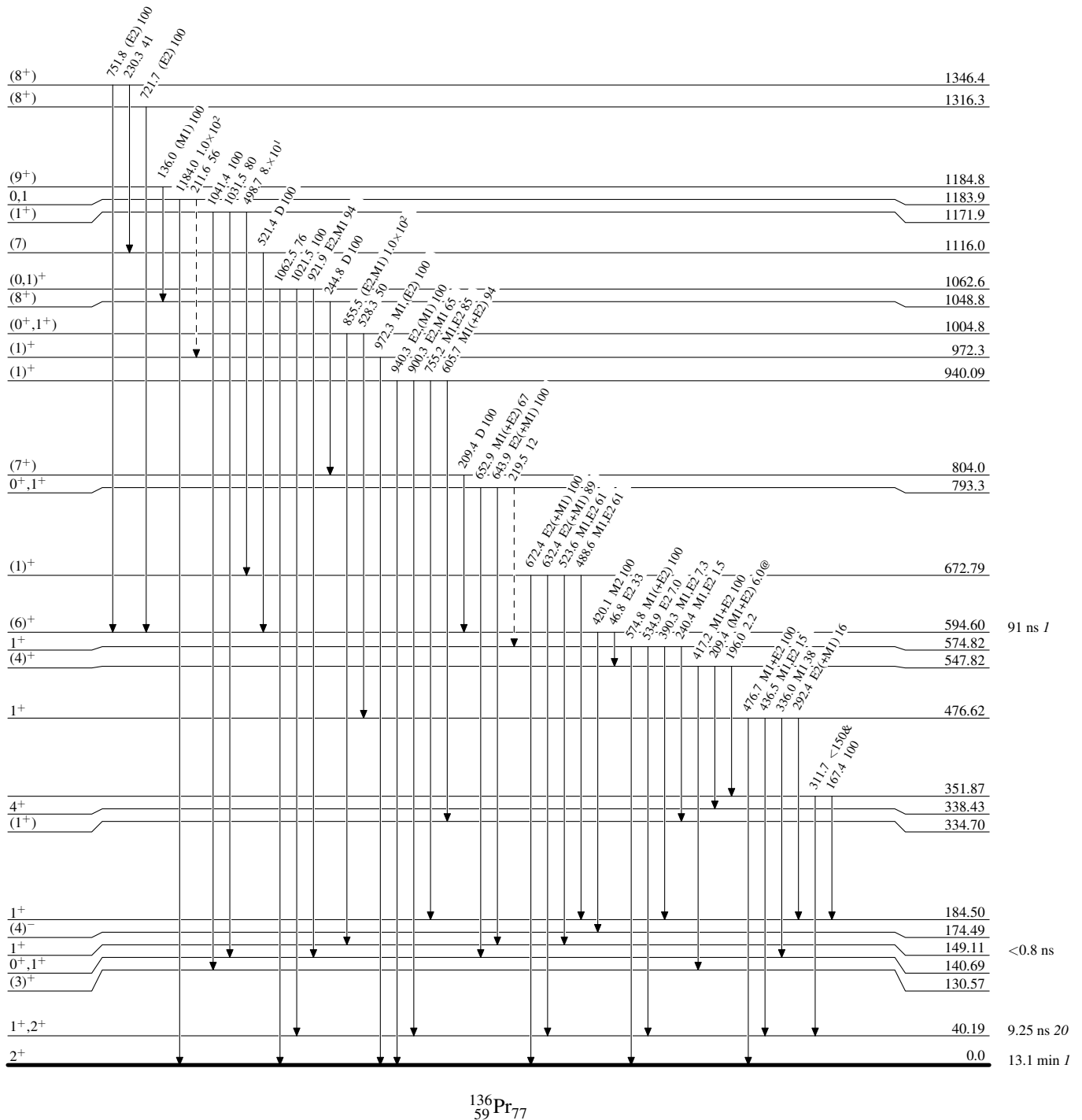
Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided



Adopted Levels, Gammas**Level Scheme (continued)**

Legend

Intensities: Relative photon branching from each level
 & Multiply placed: undivided intensity given
 @ Multiply placed: intensity suitably divided

-----► γ Decay (Uncertain)

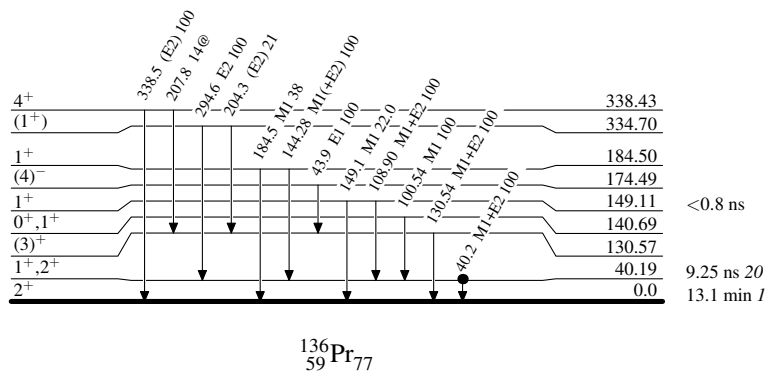
Adopted Levels, Gammas

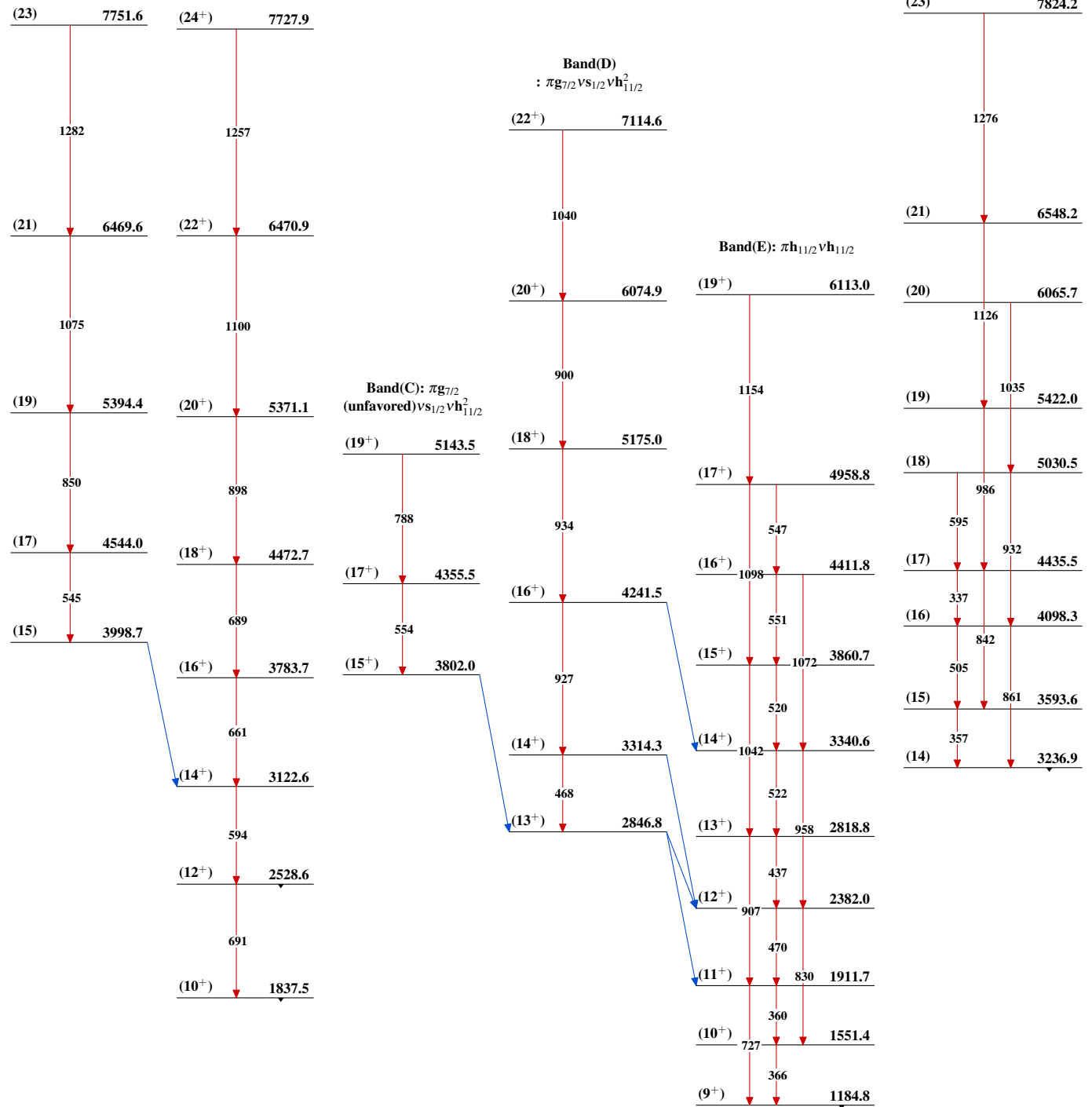
Level Scheme (continued)

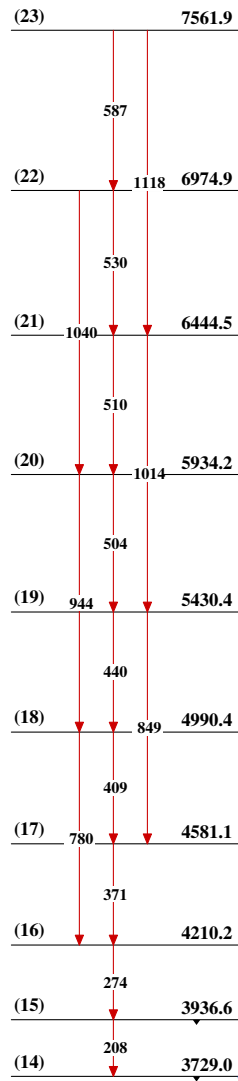
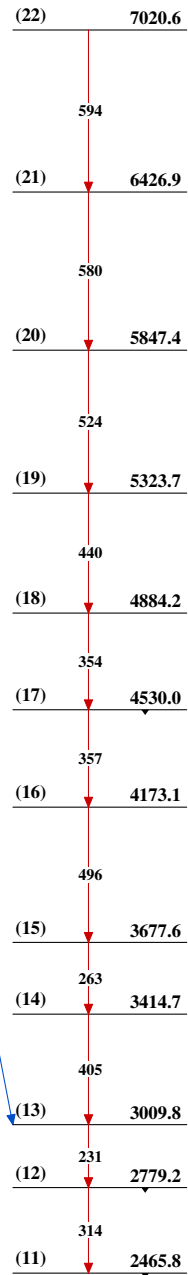
Legend

Intensities: Relative photon branching from each level
 & Multiply placed: undivided intensity given
 @ Multiply placed: intensity suitably divided

● Coincidence



Adopted Levels, GammasBand(A): Band built on
(15), 3999-keV levelBand(B): $\pi 5/2[413] \nu 1/2[660]$ Band(F): Band built on (14),
3237-keV level

Adopted Levels, Gammas (continued)**Band(G): $\pi 5/2[413]\nu 9/2[514]\pi h^2_{11/2}$** **Band(H): Band built on (11), 2466-keV level** $^{136}_{59}\text{Pr}_{77}$