

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS	113,715 (2012)	31-May-2011

$Q(\beta^-) = -3444.4$; $S(n) = 9890.24$; $S(p) = 4300.3$; $Q(\alpha) = -564.9$ [2012Wa38](#)

Note: Current evaluation has used the following Q record -3443.49875 254299.9 $28-564.8$ [2011AuZZ,2003Au03](#).

[2010Na12](#): $^{144}\text{Sm}(\gamma, p)$, measured reaction cross-section.

[1998Su03](#): calculated energy levels using microscopic quasiparticle-phonon model. Configurations are suggested for low-lying states.

[1991Lo07](#): Calculated structure of low-lying states.

 ^{143}Pm Levels

Additional levels with no J^π assignments from $^{128}\text{Te}(^{19}\text{F}, 4n\gamma)$ at 4518-, 4713-, 5040-, 5628-, 5985-, 6439-, 6704-, 7221-, 7503-, 7783-, and 8060 keV have not been adopted.

Cross Reference (XREF) Flags

A	^{143}Sm ε decay (8.75 min)	E	$^{142}\text{Nd}(\text{pol } p, p), (p, p), (p, p')$	I	$^{144}\text{Sm}(d, ^3\text{He})$
B	^{143}Sm ε decay (66 s)	F	$^{142}\text{Nd}(^3\text{He}, d)$	J	$(\text{HI}, xn\gamma)$
C	^{147}Eu α decay	G	$^{143}\text{Nd}(d, 2n\gamma)$		
D	$^{141}\text{Pr}(\alpha, 2n\gamma)$	H	$^{144}\text{Nd}(p, 2n\gamma)$		

E(level) ^{#&}	J^π [@]	$T_{1/2}$	XREF	Comments
0.0 ^a	$5/2^+$	265 d 7	ABCD FGH I J	$\% \varepsilon + \% \beta^+ = 100$; $\% \beta^+ < 5.7 \times 10^{-6}$ (1994Hi05) $\mu = +3.8$ 5 (1963Gr10, 2011StZZ) $T_{1/2}$: weighted average: 265 d 15 (1960Fu05), 265 d 10 (1963Pa21), 267 d 15 (1964Bu13). J^π : L=2 in $(d, ^3\text{He})$; γ from L=4 to L=2 level (in $(d, ^3\text{He})$) is M1+(E2).
272.04 ^a 4	$7/2^+$	1.06 ns 8	AB D FGH I J	J^π : L=4 in $(d, ^3\text{He})$; 272 γ is M1+(E2). $T_{1/2}$: from ^{143}Sm ε decay (1968He05).
959.73 13	$11/2^-$	24.0 ns 7	B D FGH I J	$\mu = +6.8$ 4 (1984Go12, 2000StZZ) $T_{1/2}$: weighted average from 24.0 ns 10 ($\alpha, 2n\gamma$) (1980Pr02) and 24.0 ns 10 ($p, 2n\gamma$) (1981Ko16); also $T_{1/2} = 24.4$ ns 14 ($\alpha, 2n\gamma$) (1975Fr18). J^π : L=5 in $(^3\text{He}, d)$, 959 γ is E3. μ : Other: +6.3 5 (1980Pr02).
1056.72 5	$3/2^+$		A D FGH I	J^π : L=2 in $(^3\text{He}, d)$; γ to $5/2^+$ is $\Delta J=1$, D+Q.
1173.19 7	$1/2^+$		A D F H I	J^π : L=0 in $(^3\text{He}, d)$.
1259.8 10	(9/2)		D	J^π : excit.
1286.5? 3	(3/2, 5/2)		D G	J^π : excit. J=3/2 favored by shell model and MQPM calculations (1998Su03).
1403.07 7	$3/2^+$		A F H I	J^π : L=2 in $(^3\text{He}, d)$, J dependence of $\sigma(\theta)$ at low angles in $(^7\text{Li}, ^6\text{He})$.
1456.37 25	$9/2^+$		D GH	J^π : γ to $5/2^+$ is $\Delta J=2$, E2; γ to $7/2^+$.
1514.91 5	$3/2^+, 5/2^+$		A H	J^π : $\log ft = 5.9$ via $3/2^+$ parent, γ to $5/2^+$ is M1+E2, $J^\pi = 5/2^+$ favored by shell model and MQPM calculations (1998Su03).
1558.7? 3	($^+$)		D GH	J^π : 1286 γ to $7/2^+$ is (E2).
1565.85 21	($5/2^+$)		D	J^π : excit; γ to $7/2^+$ is $\Delta J=1$, (M1).
1565.96 15	($9/2^+$)		D GH	J^π : γ to $5/2^+$ is $\Delta J=2$, (E2), γ to $7/2^+$ is $\Delta J=1$, E2+M1. E(level), J^π : on the basis of differences in excit 1980Pr02 introduce 2 levels: 1565.8 ($5/2^+$) and 1566.0 ($9/2^+$).
1613.86 16	$5/2^+, 3/2^+$		A F H	J^π : L=2 in $(^3\text{He}, d)$; $J^\pi = 5/2^+$ favored by shell model and MQPM calculations (1998Su03).
1663.48 ^a 10	$11/2^+$		D GH J	J^π : γ to $7/2^+$ is $\Delta J=2$, E2.

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Adopted Levels, Gammas (continued) ^{143}Pm Levels (continued)

E(level) ^{#&}	J ^π [@]	T _{1/2}	XREF	Comments
1753.46 10	1/2 ⁺		A F	J ^π : L=0 in (³ He,d).
1816.86 8			A H	
1824.56 20			H	
1854.13 9			A D H	
1898.36 ^a 14	15/2 ⁺	10.5 ns 4	D GH J	μ=+7.7 4 (1984Go12,2005St24) T _{1/2} : weighted average of 11.0 ns 7 from (α,2nγ) (1980Pr02) and 10.3 ns 5 from (p,2nγ) (1981Ko16). T _{1/2} =15.6 ns 23 (2002Bh02). μ: Other: +7.50 53 (1980Pr02). J ^π : γ to 11/2 ⁺ is ΔJ=2, E2; excit. J ^π : γ to 11/2 ⁺ is ΔJ=1, E1 (from α(K)exp); no γ to J<11/2 (p,2nγ); 1980Pr02 in (α,2nγ) find that from γ(θ) and pol the 287.3γ is M1+(E2) and therefore J ^π =13/2 ⁺ .
1950.79 13	13/2 ⁻		D FGH	J ^π : γ to 11/2 ⁺ is ΔJ=1, E1.
1969.5 5			HI	
2007.25 21			D H	
2060.31 13	13/2 ⁻		D GH	J ^π : γ to 11/2 ⁺ is ΔJ=1, E1.
2080.82 10			A	
2108.3 6			H	
2232.5 6			H	
2274.5? 12	3/2 ⁺ , 5/2 ⁺		A F	J ^π : L=2 in (³ He,d).
2280.92 11	(5/2) ⁺		A	J ^π : L=2 in (³ He,d), γ only to 7/2 ⁺ .
2287.43 ^a 16	17/2 ⁺	<0.7 ns	D GH J	T _{1/2} : From 2002Bh02. J ^π : γ to 15/2 ⁺ is ΔJ=1, M1.
2331 3	3/2 ⁺ , 5/2 ⁺		F	J ^π : L=2 in (³ He,d).
2410 3			F	
2436.93 14	15/2 ⁻		D GH J	J ^π : γ to 11/2 ⁻ is ΔJ=2, E2.
2444.02 11			A	
2464.90 11			A F	
2548 3	3/2 ⁺ , 5/2 ⁺		F	J ^π : L=2 in (³ He,d).
2613.52 17			A	
2712 3			F	
2731.6 6			A F	
2747 3			F	
2777 3			F	
2864 3			F	
2881.96 17	(17/2 ⁻)		D GH J	Additional information 1.
2905.3 5			A F	
2929.91 17	19/2 ⁻	1.95 ns 40	D GH J	T _{1/2} : From 2002Bh02. J ^π : γ to 17/2 ⁺ is ΔJ=1, E1; γ to 15/2 ⁻ is ΔJ=2, Q.
2956 3			F	
3013.32 19	21/2 ⁻		D GH J	J ^π : γ to 19/2 ⁻ is ΔJ=1, M1.
3053.5 10			F	
3061.1? 10			D	
3075.67 21	(19/2 ⁻)		D G J	Additional information 2.
3098 3			F	
3213 3			F	
3357 3			F	
3376.80 20	21/2 ⁻		D J	J ^π : γ to 19/2 ⁻ is ΔJ=1, M1; γ to 21/2 ⁻ is ΔJ=0, D+Q.
3389.82 21	23/2 ⁻		D G J	J ^π : γ to 21/2 ⁻ is ΔJ=1, M1+E2.
3524.2 4	(23/2)		D G J	
3601.64 21	23/2 ⁻		D J	J ^π : γ to 21/2 ⁻ is M1+(E2).
3780 3			F	
3840 3			F	
3872 3			F	
3908 3			F	
4281.0 ^b 3	25/2 ⁺	1.8 ns 5	D J	J ^π : γ to 23/2 ⁻ is ΔJ=1, E1.

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Adopted Levels, Gammas (continued)

^{143}Pm Levels (continued)					
E(level) ^{#&}	J^π [@]	$T_{1/2}$	XREF	Comments	
4292.61 ^c 21	25/2 ⁻		J	$T_{1/2}$: From (HI,xn γ).	
4386.21 ^b 25	27/2 ⁺		D J		
4580.3 3	27/2 ⁻		D J	J^π : γ to (23/2 ⁻) is $\Delta J=2$, Q.	
4731.8 3	27/2 ⁻		J		
4992.99 ^c 25	29/2 ⁻		J		
≈ 5000	(9/2) ⁺		I	E(level), J^π : group of levels with L=4 in (d, ³ He) (g9/2).	
5116.0 ^c 3	31/2 ⁻		J		
5628.5 ^b 3	31/2 ⁺	1.0 ns 6	J	$T_{1/2}$: From 2002Bh02.	
6075.6 ^c 3	(33/2 ⁻)		J		
6243.2 4	(35/2 ⁺)		J		
6298.1 ^b 3	35/2 ⁺		J		
6769.4 ^b 4	37/2 ⁺		J		
7829.0 ^b 4	41/2 ⁺		J		
8072.9 ^b 4	45/2 ⁺		J		
8397.8 ^b 5	(47/2 ⁺)		J		
8838.9 5			J		
9068.8 5			J		
9867.2 9			J		
10335.8 9			J		
10414.9 10			J		
10535.1 10			J		
13800 [†]	7/2 ^{-‡}	54 [‡] keV	E		
14550 [†]	3/2 ^{-‡}	79 [‡] keV	E		
15120 [†]	1/2 ^{-‡}	97 [‡] keV	E		
15240 [†]	9/2 ^{-‡}	30 [‡] keV	E		
15350 [†]	5/2 ^{-‡}	59 [‡] keV	E		
15680 [†]	7/2 ^{-‡}	39 [‡] keV	E		
15690 [†]	3/2 ^{-‡}	75 [‡] keV	E		
15750 [†]	5/2 ^{-‡}	76 [‡] keV	E		

[†] S(p)+E(res) (using S(p)=4300);[‡] From analysis of $\sigma(E,\theta)$ and analyzing power of IAR in (pol p,p), (p,p'). $T_{1/2}$ is total width (1977Cl02).[#] A strong 327 γ ray has been placed in 2000He20 to feed a 4714.3 level resulting in additional levels at 4518.7, 4714.3, 5040.8, 5985.2, 6439.6, 6704.0, 7221.4, 7503.3, 7783.4, 8059.6 which are not presented here. See (HI,xn γ).[@] J^π for levels seen only in (HI,xn γ) are based on $\gamma(\theta)$, DCO ratios.[&] See (HI,xn γ) for cascades built on 29/2⁻ and 31/2⁻ levels, not adopted.^a Band(A): γ -ray cascade based on 5/2⁺.^b Band(B): γ -ray cascade based on 25/2⁺.^c Band(C): γ -ray cascade based on 29/2⁻.

Adopted Levels, Gammas (continued)

$\gamma(^{143}\text{Pm})$

E_γ and I_γ from ¹⁴¹Pr(α,2nγ), ¹⁴⁴Nd(p,2nγ), and (HI,xnγ).

E _i (level)	J _i ^π	E _γ	I _γ	E _f	J _f ^π	Mult. [‡]	δ	α [†]	Comments
272.04	7/2 ⁺	272.10 5	100	0.0	5/2 ⁺	M1+(E2)	<0.15	0.0961	α(K)=0.0818 12; α(L)=0.01131 16; α(M)=0.00241 4; α(N+..)=0.000631 9 B(M1)(W.u.)>0.00085; B(E2)(W.u.)<0.17 Mult.: α(K), α(L), α(M), α(N+..) for M1.
959.73	11/2 ⁻	687.7 4	100 22	272.04	7/2 ⁺	M2		0.0253	α(K)=0.0213 3; α(L)=0.00313 5; α(M)=0.000673 10; α(N+..)=0.0001762 25 B(M2)(W.u.)=0.25 8
		959.8 2	20 5	0.0	5/2 ⁺	E3		0.00557 8	α(K)=0.00461 7; α(L)=0.000756 11; α(M)=0.0001642 23; α(N+..)=4.25×10 ⁻⁵ 6 B(E3)(W.u.)=9 3
1056.72	3/2 ⁺	1056.58 7	100	0.0	5/2 ⁺	D+Q			
1173.19	1/2 ⁺	1173.18 7	100	0.0	5/2 ⁺	Q			
1259.8	(9/2)	1259.8	100	0.0	5/2 ⁺				
1286.5?	(3/2,5/2)	1014.5 3	100	272.04	7/2 ⁺				
		1286.7& 3	<33	0.0	5/2 ⁺				
1403.07	3/2 ⁺	1403.06 7	100	0.0	5/2 ⁺	E2+(M1)		0.00147 24	α(K)=0.00122 21; α(L)=0.00016 3; α(M)=3.4×10 ⁻⁵ 6; α(N+..)=5.6×10 ⁻⁵ 3
1456.37	9/2 ⁺	1184.3 3	10.4 26	272.04	7/2 ⁺				
		1456.4 4	100 4	0.0	5/2 ⁺	E2		0.001166 17	α(K)=0.000946 14; α(L)=0.0001253 18; α(M)=2.66×10 ⁻⁵ 4; α(N+..)=6.84×10 ⁻⁵
1514.91	3/2 ⁺ ,5/2 ⁺	458.11 5	5.5 6	1056.72	3/2 ⁺				
		1242.95 7	33 2	272.04	7/2 ⁺				
		1514.98 7	100 4	0.0	5/2 ⁺	M1+E2		0.00129 19	α(K)=0.00104 17; α(L)=0.000136 21; α(M)=2.9×10 ⁻⁵ 5; α(N+..)=9.1×10 ⁻⁵ 5
1558.7?	(⁺)	1286.7& 3	100	272.04	7/2 ⁺	(E2)		0.001427 20	α(K)=0.001203 17; α(L)=0.0001616 23; α(M)=3.43×10 ⁻⁵ 5; α(N+..)=2.72×10 ⁻⁵
1565.85	(5/2 ⁺)	1293.8 2	100	272.04	7/2 ⁺	(M1)		0.00202 3	α(K)=0.001718 24; α(L)=0.000225 4; α(M)=4.76×10 ⁻⁵ 7; α(N+..)=3.30×10 ⁻⁵ 5
1565.96	(9/2) ⁺	1293.9 3	100 15	272.04	7/2 ⁺	E2+M1		0.0017 3	α(K)=0.0015 3; α(L)=0.00019 4; α(M)=4.1×10 ⁻⁵ 7; α(N+..)=3.07×10 ⁻⁵ 24
		1566.0 2	41 9	0.0	5/2 ⁺	(E2)		0.001061 15	α(K)=0.000824 12; α(L)=0.0001084 16; α(M)=2.30×10 ⁻⁵ 4; α(N+..)=0.000105
1613.86	5/2 ⁺ ,3/2 ⁺	1341.81 15	100	272.04	7/2 ⁺				
1663.48	11/2 ⁺	97.6 3	<1	1565.96	(9/2) ⁺				
		1391.4 1	100	272.04	7/2 ⁺	E2		0.001249 18	α(K)=0.001033 15; α(L)=0.0001375 20; α(M)=2.92×10 ⁻⁵ 4; α(N+..)=4.97×10 ⁻⁵

Adopted Levels, Gammas (continued)

$\gamma(^{143}\text{Pm})$ (continued)								
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult. [‡]	$\alpha^\dagger$	Comments
1753.46	1/2 ⁺	1753.45 10	100	0.0	5/2 ⁺			
1816.86		1544.87 10	100 11	272.04	7/2 ⁺			
		1816.78 10	48 11	0.0	5/2 ⁺			
1824.56		767.8 2	45 10	1056.72	3/2 ⁺			
	15/2 ⁺	1824.8 6	100 20	0.0	5/2 ⁺			
1854.13		797.49 15	100 25	1056.72	3/2 ⁺			
		1854.08 10	75 12	0.0	5/2 ⁺			
1898.36		234.9 1	100	1663.48	11/2 ⁺	E2	0.1187	$\alpha(\text{K})=0.0897$ 13; $\alpha(\text{L})=0.0227$ 4; $\alpha(\text{M})=0.00506$ 8; $\alpha(\text{N}+..)=0.001272$ 18 B(E2)(W.u.)=1.52 6
1950.79	13/2 ⁻	287.3 1	100 3	1663.48	11/2 ⁺	E1	0.01577	$\alpha(\text{K})=0.01347$ 19; $\alpha(\text{L})=0.00181$ 3; $\alpha(\text{M})=0.000385$ 6; $\alpha(\text{N}+..)=9.96\times 10^{-5}$ 14
	13/2 ⁻	991.1 2	27 9	959.73	11/2 ⁻			
1969.5		1697.5 5	100	272.04	7/2 ⁺			
2007.25		1735.2 2	100	272.04	7/2 ⁺	Q		
2060.31		396.8 1	100	1663.48	11/2 ⁺			
2080.82	3/2 ⁺ , 5/2 ⁺	1808.64 23	10 2	272.04	7/2 ⁺			
		2080.83 10	100 29	0.0	5/2 ⁺			
2108.3		1836.2 6	100	272.04	7/2 ⁺			
2232.5		1960.4 6	100	272.04	7/2 ⁺			
2274.5?	3/2 ⁺ , 5/2 ⁺	2002.5 & 10	100	272.04	7/2 ⁺			E_γ, I_γ : from ^{143}Sm ε decay (1969He10); not observed in 1970De29.
2280.92		2008.87 10	100	272.04	7/2 ⁺			
2287.43	17/2 ⁺	389.10 12	100	1898.36	15/2 ⁺	M1	0.0377	$\alpha(\text{K})=0.0321$ 5; $\alpha(\text{L})=0.00437$ 7; $\alpha(\text{M})=0.000930$ 13; $\alpha(\text{N}+..)=0.000244$ 4 B(M1)(W.u.)>0.00051
2436.93	15/2 ⁻	376.5 # 2		2060.31	13/2 ⁻			
		1477.2 1	100	959.73	11/2 ⁻	E2	0.001143 16	$\alpha(\text{K})=0.000921$ 13; $\alpha(\text{L})=0.0001218$ 17; $\alpha(\text{M})=2.58\times 10^{-5}$ 4; $\alpha(\text{N}+..)=7.49\times 10^{-5}$
2444.02	(17/2 ⁻)	2171.95 10	100 13	272.04	7/2 ⁺			
		2444.17 40	50 25	0.0	5/2 ⁺			
2464.90		2192.84 10	100 22	272.04	7/2 ⁺			
2613.52		2342.24 30	16 5	272.04	7/2 ⁺			
	19/2 ⁻	2613.15 20	100 16	0.0	5/2 ⁺			
2731.6		2459.52 60	100	272.04	7/2 ⁺			
2881.96		983.6 1	100	1898.36	15/2 ⁺			E2 in $^{135}\text{Ba}(^{11}\text{B}, 3n\gamma)$ based on DCO=1.12 16, and E1 in $^{141}\text{Pr}(\alpha, 2n\gamma)$.
2905.3		2633.35 50	100 33	272.04	7/2 ⁺			
	19/2 ⁻	2904 2	23 7	0.0	5/2 ⁺			
2929.91		492.9 2	7	2436.93	15/2 ⁻	E2	0.01277	$\alpha(\text{K})=0.01052$ 15; $\alpha(\text{L})=0.001769$ 25; $\alpha(\text{M})=0.000384$ 6; $\alpha(\text{N}+..)=9.86\times 10^{-5}$ 14 B(E2)(W.u.)=0.015 3
		642.5 1	100	2287.43	17/2 ⁺	E1	0.00238 4	$\alpha(\text{K})=0.00204$ 3; $\alpha(\text{L})=0.000265$ 4; $\alpha(\text{M})=5.61\times 10^{-5}$ 8;

Adopted Levels, Gammas (continued)

$\gamma(^{143}\text{Pm})$ (continued)									
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult. [‡]	δ	$\alpha^\dagger$	Comments
3013.32	21/2 ⁻	83.4 1	100	2929.91	19/2 ⁻	M1		2.61	$\alpha(\text{N}+..)=1.461\times 10^{-5}$ 21 B(E1)(W.u.)= 4.5×10^{-7} 10 $\alpha(\text{K})=2.21$ 4; $\alpha(\text{L})=0.312$ 5; $\alpha(\text{M})=0.0666$ 10; $\alpha(\text{N}+..)=0.0174$ 3
3053.5		2781 1 3057 3	100 50 75 25	272.04 0.0	7/2 ⁺ 5/2 ⁺				
3061.1?		1000.8		2060.31	13/2 ⁻				
3075.67	(19/2 ⁻)	145.6 2 193.6	100 63	2929.91 2881.96	19/2 ⁻ (17/2 ⁻)	D+Q M1+E2	+0.11 4	0.242	$\alpha(\text{K})=0.205$ 3; $\alpha(\text{L})=0.0288$ 5; $\alpha(\text{M})=0.00616$ 10; $\alpha(\text{N}+..)=0.00161$ 3 Mult.: E2 in $^{135}\text{Ba}(^{11}\text{B},3\text{n}\gamma)$ based on DCO=1.6 3; E1 in $^{141}\text{Pr}(\alpha,2\text{n}\gamma)$.
		788.5	79	2287.43	17/2 ⁺				
3376.80	21/2 ⁻	301.1 1	100	3075.67	(19/2 ⁻)	M1+E2	-0.27 24	0.072 3	$\alpha(\text{K})=0.061$ 3; $\alpha(\text{L})=0.00863$ 14; $\alpha(\text{M})=0.00184$ 4; $\alpha(\text{N}+..)=0.000481$ 8
		363.5 1	57	3013.32	21/2 ⁻	M1+E2		0.038 8	$\alpha(\text{K})=0.031$ 7; $\alpha(\text{L})=0.0049$ 3; $\alpha(\text{M})=0.00107$ 5; $\alpha(\text{N}+..)=0.000276$ 16
		447.0 2	31	2929.91	19/2 ⁻	M1		0.0264	$\alpha(\text{K})=0.0225$ 4; $\alpha(\text{L})=0.00305$ 5; $\alpha(\text{M})=0.000649$ 10; $\alpha(\text{N}+..)=0.0001698$ 24
3389.82	23/2 ⁻	376.5 [#] 1	100	3013.32	21/2 ⁻	M1+E2		0.034 7	$\alpha(\text{N})=0.0001463$ 21; $\alpha(\text{O})=2.21\times 10^{-5}$ 4; $\alpha(\text{P})=1.424\times 10^{-6}$ 20 $\alpha(\text{K})=0.028$ 7; $\alpha(\text{L})=0.0045$ 4; $\alpha(\text{M})=0.00096$ 6; $\alpha(\text{N}+..)=0.000249$ 17 $\alpha(\text{N})=0.000215$ 14; $\alpha(\text{O})=3.2\times 10^{-5}$ 3; $\alpha(\text{P})=1.7\times 10^{-6}$ 5
3524.2	(23/2)	134.4 3	100	3389.82	23/2 ⁻				
3601.64	23/2 ⁻	588.3 1	100	3013.32	21/2 ⁻	M1+(E2)	+0.13 4	0.01313 20	$\alpha(\text{K})=0.01122$ 17; $\alpha(\text{L})=0.001507$ 22; $\alpha(\text{M})=0.000320$ 5; $\alpha(\text{N}+..)=8.39\times 10^{-5}$ 13
		671.9 3	12	2929.91	19/2 ⁻				
4281.0	25/2 ⁺	891.2 2	100	3389.82	23/2 ⁻	E1		0.001224 18	$\alpha(\text{K})=0.001053$ 15; $\alpha(\text{L})=0.0001349$ 19; $\alpha(\text{M})=2.85\times 10^{-5}$ 4; $\alpha(\text{N}+..)=7.43\times 10^{-6}$ B(E1)(W.u.)= 1.9×10^{-7} 6
4292.61	25/2 ⁻	1279.3 1	100.0	3013.32	21/2 ⁻	E2		0.001442 21	$\alpha(\text{K})=0.001217$ 17; $\alpha(\text{L})=0.0001635$ 23; $\alpha(\text{M})=3.48\times 10^{-5}$ 5; $\alpha(\text{N}+..)=2.61\times 10^{-5}$
4386.21	27/2 ⁺	93.6 2	22.53	4292.61	25/2 ⁻	E1		0.320	$\alpha(\text{K})=0.270$ 4; $\alpha(\text{L})=0.0395$ 6; $\alpha(\text{M})=0.00839$ 13; $\alpha(\text{N}+..)=0.00214$ 4
		105.2 2	100.0	4281.0	25/2 ⁺	M1+E2		1.6 3	$\alpha(\text{K})=1.09$ 6; $\alpha(\text{L})=0.41$ 25; $\alpha(\text{M})=0.09$ 6; $\alpha(\text{N}+..)=0.023$ 15
4580.3	27/2 ⁻	1190.4 2	100	3389.82	23/2 ⁻	E2		0.001651 24	$\alpha(\text{K})=0.001405$ 20; $\alpha(\text{L})=0.000190$ 3; $\alpha(\text{M})=4.05\times 10^{-5}$ 6; $\alpha(\text{N}+..)=1.536\times 10^{-5}$ 2
4731.8	27/2 ⁻	1342.0 2	100.0	3389.82	23/2 ⁻	E2		0.001325 19	$\alpha(\text{K})=0.001108$ 16; $\alpha(\text{L})=0.0001481$ 21; $\alpha(\text{M})=3.14\times 10^{-5}$ 5; $\alpha(\text{N}+..)=3.77\times 10^{-5}$
4992.99	29/2 ⁻	261.2 2	100.0	4731.8	27/2 ⁻	M1+E2		0.096 12	$\alpha(\text{K})=0.078$ 14; $\alpha(\text{L})=0.0139$ 13; $\alpha(\text{M})=0.0030$ 4; $\alpha(\text{N}+..)=0.00078$ 8

Adopted Levels, Gammas (continued)

$\gamma(^{143}\text{Pm})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult. [‡]	$\alpha^\dagger$	Comments
4992.99	29/2 ⁻	700.4 2	90.91	4292.61	25/2 ⁻	E2	0.00525 8	$\alpha(\text{K})=0.00441$ 7; $\alpha(\text{L})=0.000662$ 10; $\alpha(\text{M})=0.0001422$ 20; $\alpha(\text{N}+..)=3.68\times 10^{-5}$ 6
5116.0	31/2 ⁻	123.0 2 535.6 2	30.26 100.0	4992.99 4580.3	29/2 ⁻ 27/2 ⁻	M1+E2 E2	0.97 12 0.01024	$\alpha(\text{K})=0.69$ 4; $\alpha(\text{L})=0.22$ 12; $\alpha(\text{M})=0.05$ 3; $\alpha(\text{N}+..)=0.012$ 7 $\alpha(\text{K})=0.00848$ 12; $\alpha(\text{L})=0.001384$ 20; $\alpha(\text{M})=0.000300$ 5; $\alpha(\text{N}+..)=7.71\times 10^{-5}$ 11
5628.5	31/2 ⁺	1242.3 1	100.0	4386.21	27/2 ⁺	E2	0.001522 22	$\alpha(\text{K})=0.001290$ 18; $\alpha(\text{L})=0.0001740$ 25; $\alpha(\text{M})=3.70\times 10^{-5}$ 6; $\alpha(\text{N}+..)=2.09\times 10^{-5}$ B(E2)(W.u.)=0.004 3
6075.6	(33/2 ⁻)	959.6 2	100.0	5116.0	31/2 ⁻	M1+E2	0.0033 8	$\alpha(\text{K})=0.0028$ 7; $\alpha(\text{L})=0.00038$ 8; $\alpha(\text{M})=8.1\times 10^{-5}$ 16; $\alpha(\text{N}+..)=2.1\times 10^{-5}$ 5
6243.2	(35/2 ⁺)	614.7 2	100.0	5628.5	31/2 ⁺	(E2)	0.00721 11	$\alpha(\text{K})=0.00602$ 9; $\alpha(\text{L})=0.000938$ 14; $\alpha(\text{M})=0.000202$ 3; $\alpha(\text{N}+..)=5.22\times 10^{-5}$ 8
6298.1	35/2 ⁺	222.5 2 669.6 1	6.879 100.0	6075.6 5628.5	(33/2 ⁻) 31/2 ⁺	E2	0.00584 9	$\alpha(\text{K})=0.00490$ 7; $\alpha(\text{L})=0.000745$ 11; $\alpha(\text{M})=0.0001602$ 23; $\alpha(\text{N}+..)=4.14\times 10^{-5}$ 6
6769.4	37/2 ⁺	471.3 2 694.3	100.00	6298.1 6075.6	35/2 ⁺ (33/2 ⁻)	M1+E2	0.019 5	$\alpha(\text{K})=0.016$ 4; $\alpha(\text{L})=0.0023$ 4; $\alpha(\text{M})=0.00050$ 7; $\alpha(\text{N}+..)=0.000131$ 18
7829.0	41/2 ⁺	1059.5 2	100.0	6769.4	37/2 ⁺	E2	0.00209 3	$\alpha(\text{K})=0.001780$ 25; $\alpha(\text{L})=0.000245$ 4; $\alpha(\text{M})=5.23\times 10^{-5}$ 8; $\alpha(\text{N}+..)=1.362\times 10^{-5}$ 19
8072.9	45/2 ⁺	243.8 2 1303.5 2	94.72 100.0	7829.0 6769.4	41/2 ⁺ 37/2 ⁺	E2	0.1051	$\alpha(\text{K})=0.0800$ 12; $\alpha(\text{L})=0.0197$ 3; $\alpha(\text{M})=0.00438$ 7; $\alpha(\text{N}+..)=0.001103$ 16
8397.8	(47/2 ⁺)	325.0 @ 2	100.0 @	8072.9	45/2 ⁺	M1+E2	0.051 9	$\alpha(\text{K})=0.042$ 9; $\alpha(\text{L})=0.00694$ 13; $\alpha(\text{M})=0.001504$ 23; $\alpha(\text{N}+..)=0.000388$ 7
8838.9		766.0 2	100.0	8072.9	45/2 ⁺			
9068.8		229.9 2	100.0	8838.9				
		671.4		8397.8	(47/2 ⁺)			
		995.9		8072.9	45/2 ⁺			
9867.2		798.4		9068.8				
10335.8		468.6		9867.2				
		1267.0		9068.8				
10414.9		1346.1		9068.8				
10535.1		120.2		10414.9				
		199.3		10335.8				
		667.9		9867.2				

[†] Additional information 3.

[‡] From $\gamma(\theta)$ and $\alpha(\text{K})\exp$ in (p,2n γ); $\gamma(\theta)$ and linear pol in (α ,2n γ).

Multiply placed.

@ Multiply placed with undivided intensity.

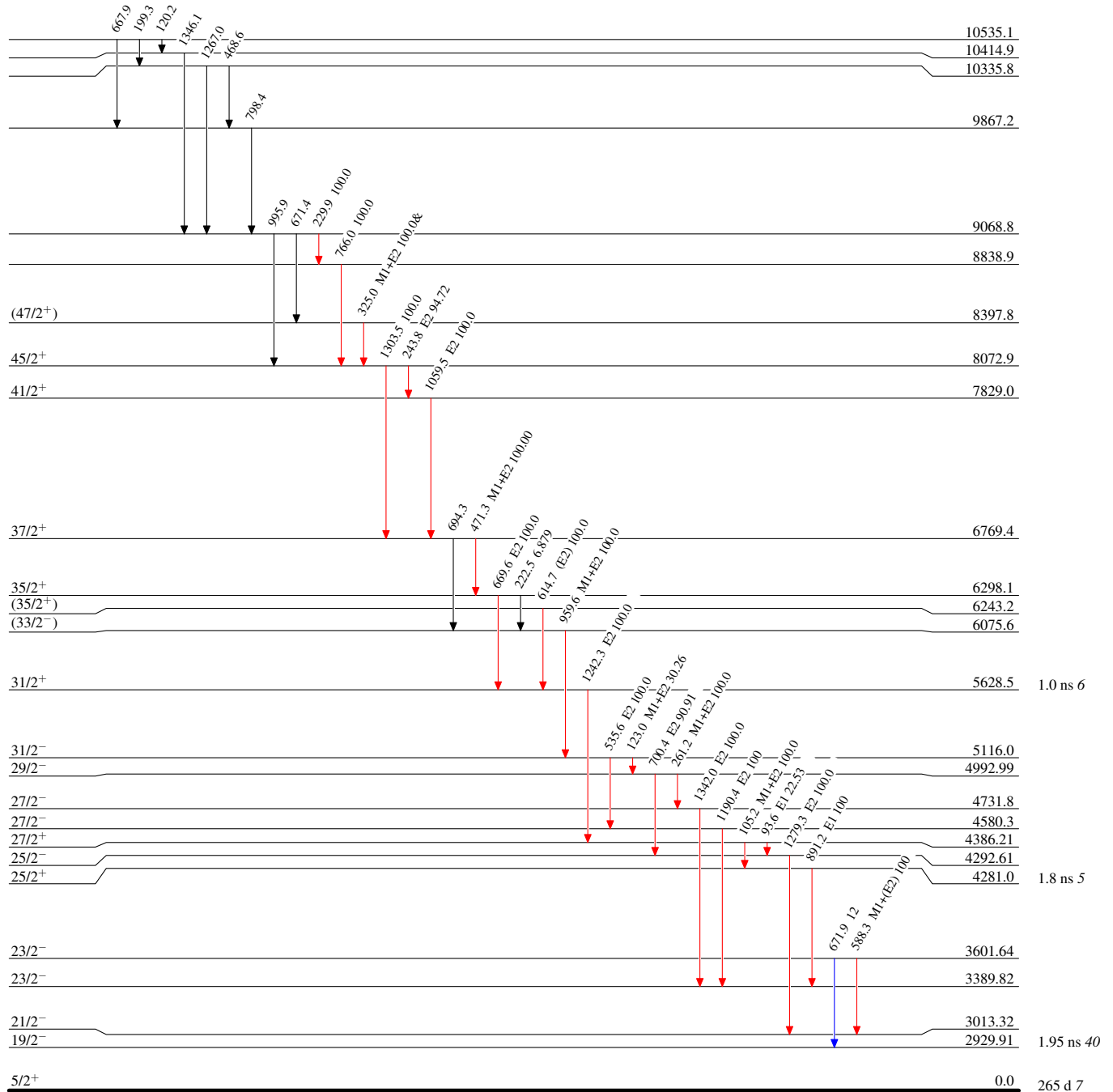
& Placement of transition in the level scheme is uncertain.

Adopted Levels, GammasLevel Scheme

Intensities: Type not specified
& Multiply placed: undivided intensity given

Legend

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

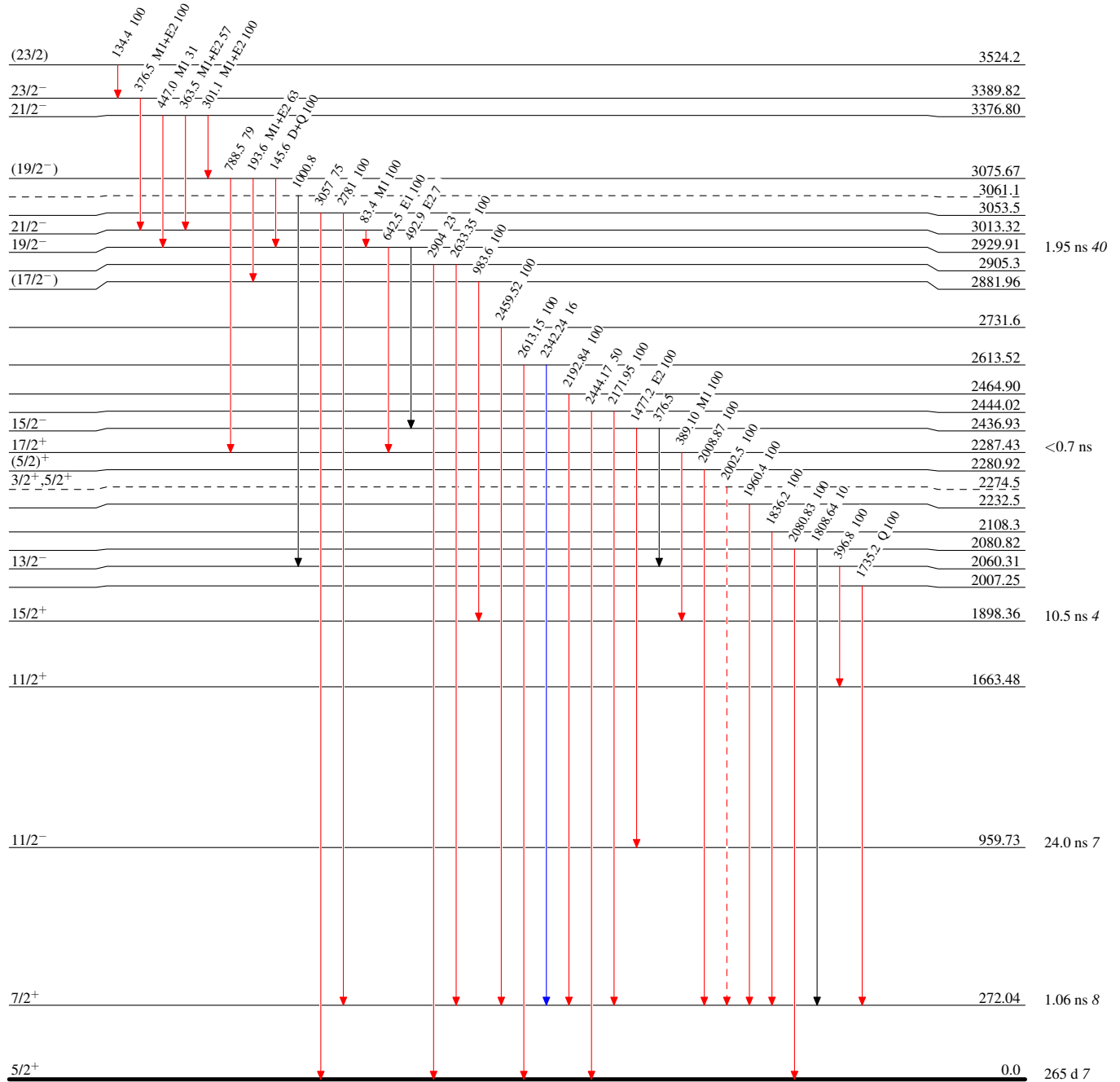


Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Type not specified
& Multiply placed: undivided intensity given

Legend

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

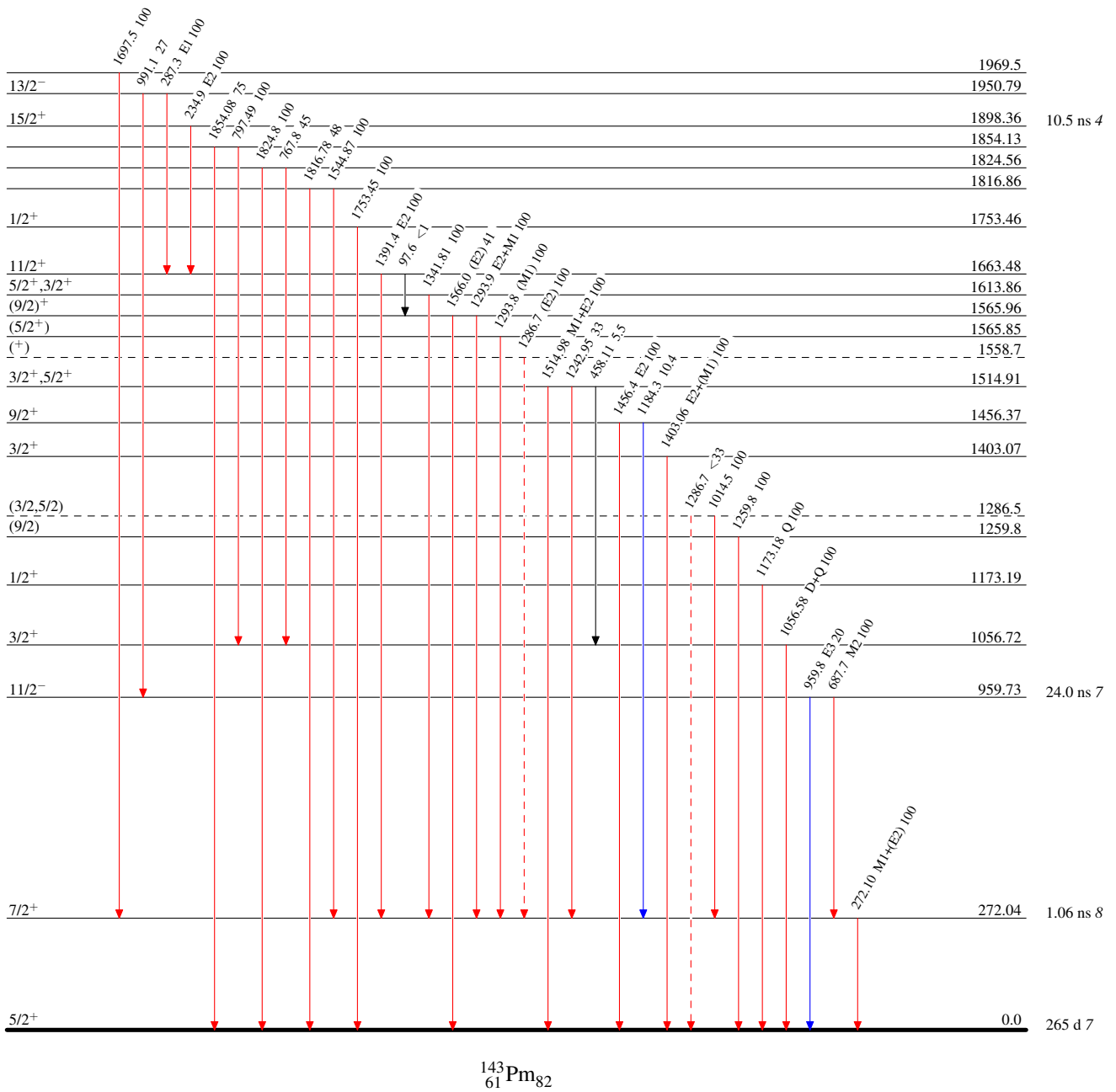


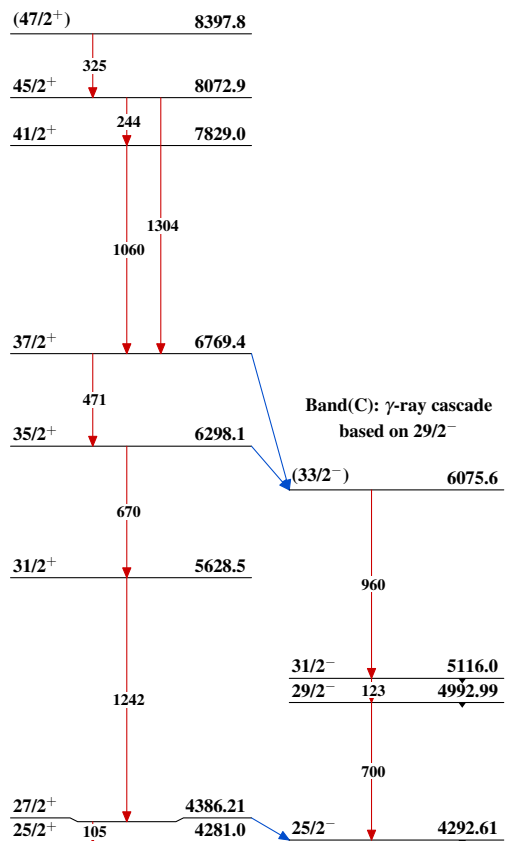
Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Type not specified
& Multiply placed: undivided intensity given

Legend

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



Adopted Levels, Gammas**Band(B): γ -ray cascade based on $25/2^+$** **Band(A): γ -ray cascade based on $5/2^+$** 