

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne and A. Negret	NDS	109,943 (2008)	1-May-2007

$Q(\beta^-)=3635$ 16; $S(n)=6869$ 13; $S(p)=13518$ 11; $Q(\alpha)=-6972$ 13 [2012Wa38](#)
 Note: Current evaluation has used the following Q record 3520 126990 70 $1.269\text{e}^+410-6.94\times 10^{35}$ [2003Au03](#).

 ^{106}Mo LevelsCross Reference (XREF) Flags

- A** ^{106}Nb β^- decay
B ^{248}Cm SF decay
C ^{252}Cf SF decay
D $^{238}\text{U}(\alpha, F)$

E(level) [†]	J ^π [‡]	T _{1/2}	XREF	Comments
0.0	0 ⁺	8.73 s 12	ABCD	$\% \beta^- = 100$ T _{1/2} : From β^- decay curves (1995Jo02) Others: 8.4 s 5 via (55,86,430,466,595,618 γ)-decay curves (1977Ti02); 8.2 s 10 (1976KaYO), 11 s 2 (1972Tr08), 9.5 s 5 (1969Ha59), 7.9 s 12 (1969WiZX).
171.549 [#] 8	2 ⁺	1.25 ns 3	ABCD	$\mu=0.42$ 4 T _{1/2} : from recoil-distance Doppler shift in ^{252}Cf SF decay (1974JaZN). Others: 0.75 ns 15 (1970Ch11); 1.2 ns 1 from ^{252}Cf SF decay (2006Hw01). μ : Measured with Gammasphere using time-integral perturbed angular correlations (2004Sm04).
522.32 [#] 8	4 ⁺	25.4 ps 51	ABCD	T _{1/2} : measured using recoil distance method in ^{252}Cf SF decay (2003Hu07).
710.48 [@] 6	2 ⁺		ABCD	
885.17 [@] 7	3 ⁺		ABCD	
956.55 20	(0 ⁺)		A	J ^π : Suggested from γ decay to 2 ⁺ level only.
1033.34 [#] 10	6 ⁺	4.2 ps 18	ABCD	T _{1/2} : measured using the recoil distance method (2003Hu07).
1067.77 [@] 7	4 ⁺		ABCD	
1149.84 ^c 19	(2 ⁺)		C	
1279.9 5			A	
1306.81 [@] 8	5 ⁺		BCD	
1434.73 ^b 8	4 ⁺		ABCD	
1536.46 ^c 17	(4 ⁺)		C	
1563.25 [@] 10	6 ⁺		BCD	
1657.64 ^b 8	5 ⁺		BCD	
1688.26 [#] 12	8 ⁺	1.77 ps 24	BCD	T _{1/2} : measured from Doppler-broadened line shapes analysis; value based on the assumption that the transition quadrupole moment=2.85 13 for all members of the g.s. band with 8<J<12 (1996Sm04).
1817.22 ^{&} 17	(3 ⁻)		C	
1868.08 [@] 16	7 ⁺		BCD	
1910.30 ^b 9	6 ⁺		BCD	
1936.82 ^{&} 9	(4 ⁻)		BC	
1952.20 ^a 11	(5 ⁻)		BC	
2014.73 ^c 18	(6 ⁺)		BC	
2090.40 ^{&} 14	(5 ⁻)		C	
2142.50 ^a 15	(6 ⁻)		BC	J ^π : (5 ⁻) from 2002Ha46 in ^{252}Cf SF decay.
2146.81 ^d 20	(5 ⁻)		C	

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Adopted Levels, Gammas (continued) ^{106}Mo Levels (continued)

E(level) [†]	J ^π [‡]	T _{1/2}	XREF	Comments
2194.27 [@] 13	8 ⁺		BCD	
2199.66 ^b 10	7 ⁺		BCD	
2276.32 ^{&} 10	(6 ⁻)		BC	
2302.71 ^e 20	(5 ⁺)		C	
2368.89 ^a 14	(7 ⁻)		BC	J ^π : (6 ⁻) from 2002Ha46 in ^{252}Cf SF decay.
2472.4 [#] 4	10 ⁺	0.69 ps 9	BCD	T _{1/2} : measured from Doppler-broadened line shapes analysis; value based on the assumption that the transition quadrupole moment =2.85 13 for all members of the g.s. band with 8<J<12 (1996Sm04).
2498.84 ^{&} 12	(7 ⁻)		BC	
2520.93 ^b 23	8 ⁺		CD	
2559.2 [@] 3	9 ⁺		CD	
2565.98 ^c 14	(8 ⁺)		BC	
2566.04 ^d 20	(7 ⁻)		C	
2629.14 ^a 17	(8 ⁻)		BC	J ^π : (7 ⁻) from 2002Ha46 in ^{252}Cf SF decay.
2713.15 ^e 20	(7 ⁺)		C	
2746.50 ^{&} 12	(8 ⁻)		BC	
2877.5 ^b 4	9 ⁺		CD	
2921.37 ^a 16	(9 ⁻)		BC	J ^π : (8 ⁻) from 2002Ha46 in ^{252}Cf SF decay.
2950.72 [@] 24	10 ⁺		CD	
3041.5 ^{&} 3	(9 ⁻)		C	
3132.2 ^d 3	(9 ⁻)		C	
3184.8 ^c 4	(10 ⁺)		C	
3238.35 ^a 23	(10 ⁻)		BC	J ^π : (9 ⁻) from 2002Ha46 in ^{252}Cf SF decay.
3253.7 ^e 3	(9 ⁺)		C	
3263.9 ^b 4	10 ⁺		C	
3349.7 ^{&} 3	(10 ⁻)		C	
3369.1 [#] 6	12 ⁺	0.37 ps 4	CD	T _{1/2} : measured from Doppler-broadened line shapes analysis; value based on the assumption that the transition quadrupole moment =2.85 13 for all members of the g.s. band with 8<J<12 (1996Sm04).The evaluators assume that the 889.9γ of 1996Sm04 is the same as the adopted 896.7 keV gamma.
3369.6 [@] 11	11 ⁺		C	
3591.9 ^a 4	(11 ⁻)		C	J ^π : (10 ⁻) from 2002Ha46 in ^{252}Cf SF decay.
3682.2 ^b 5	11 ⁺		CD	
3707.6 ^{&} 5	(11 ⁻)		C	
3810.5 [@] 11	12 ⁺		CD	
3843.6 ^d 4	(11 ⁻)		C	
3928.5 ^e 4	(11 ⁺)		C	
3945.3 ^a 8	(12 ⁻)		C	
4049.3 ^{&} 11	(12 ⁻)		C	
4132.5 ^b 5	(12 ⁺)		C	
4291.9 [@] 15	13 ⁺		CD	
4362.0 [#] 12	14 ⁺		CD	
4371.8 ^a 11	(13 ⁻)		C	
4596.1 21	13 ⁺		D	
4751.4 [@] 23	14 ⁺		D	E(level): Taken from $^{238}\text{U}(\alpha, \text{F}\gamma)$ (2004Hu02).
4752.1 ^a 13	(14 ⁻)		C	E(level): from 2005Zh36 and 2006Jo05.
4756.3 12	14 ⁺		C	

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Adopted Levels, Gammas (continued) ^{106}Mo Levels (continued)

E(level) [†]	J ^π [‡]	XREF	Comments
5307.3 [@] 25	15 ⁺	D	E(level): Taken from $^{238}\text{U}(\alpha, F\gamma)$ (2004Hu02).
5412.8 [#] 24	16 ⁺	D	E(level): Taken from $^{238}\text{U}(\alpha, F\gamma)$ (2004Hu02).
5425.2 [#] 7	16 ⁺	C	
5766.8 [@] 24	16 ⁺	D	E(level): Taken from $^{238}\text{U}(\alpha, F\gamma)$ (2004Hu02).
6392 [@] 3	17 ⁺	D	E(level): Taken from $^{238}\text{U}(\alpha, F\gamma)$ (2004Hu02).
6501 [#] 3	18 ⁺	D	
6867 [@] 3	18 ⁺	D	
7660 [#] 4	20 ⁺	D	

[†] Calculated from adopted gammas using least-squares fit, unless noted otherwise. There are discrepancies of several keV between corresponding levels observed in different fission data sets. The level energies above 4.5 MeV were taken from 2004Hu02 from $^{238}\text{U}(\alpha, F)$, if available, but are considered by the evaluators as approximate.

[‡] From observed band structure and systematics in ^{252}Cf SF decay based on well established data of g.s.-band, one-phonon and two-phonon gamma-vibrational bands and Nilsson model considerations. If not mentioned otherwise from 2002Xu03 because this paper has the most detailed discussion on the experimental data taken with Gammasphere.

[#] Band(A): g.s., Yrast band.

[@] Band(B): γ band.

[&] Band(C): $\nu(3/2[411] \otimes \nu(3/2)[541])^{-1}$. Possible 'chiral' partner of $\nu(5/2[413] \otimes \nu(5/2[532])$ (2005Zh36).

^a Band(D): $\nu(5/2[413] \otimes \nu(5/2)[532])$. Possible 'chiral' partner of $\nu(3/2[411] \otimes \nu(3/2[541])^{-1}$ (2005Zh36).

^b Band(E): $\gamma\gamma$ phonon band.

^c Band(F): Band based on a (2⁺).

^d Band(G): $\pi(7/2[413] \otimes \pi(3/2[301])$.

^e Band(H): $\pi(1/2[420] \otimes \pi(9/2[404])$.

 $\gamma(^{106}\text{Mo})$

E _i (level)	J _i ^π	E _γ [†]	I _γ [‡]	E _f	J _f ^π	Mult.	Comments
171.549	2 ⁺	171.548 8	100 2	0.0	0 ⁺	[E2]	B(E2)(W.u.)=102.3 25 Mult.: consistent with (171.9γ)(θ) (1972Wi15) being Q; E2 from observed band structure. E _γ : from curved crystal spectrometer (1979Bo26); others: 171.57 10 (1969WiZX), 171.7 (1970Ch11), 172.2 2 (1970Jo20), 171.6 2 (1974ClZX), 172.0 (1977YoZM).
522.32	4 ⁺	350.69 14	100	171.549	2 ⁺	[E2]	B(E2)(W.u.)=1.4×10 ² 3 The transition quadrupole moment calculated from the lifetime =3.82 50.
710.48	2 ⁺	538.88 12	100 20	171.549	2 ⁺		
		710.54 9	73 27	0.0	0 ⁺		
885.17	3 ⁺	174.60 10	100	710.48	2 ⁺		
		362.80 10		522.32	4 ⁺		
		713.60 14		171.549	2 ⁺		
956.55	(0 ⁺)	785.00 20	100	171.549	2 ⁺		
1033.34	6 ⁺	511.20 25	100	522.32	4 ⁺	[E2]	B(E2)(W.u.)=1.3×10 ² 6 The transition quadrupole moment calculated from the lifetime =3.39 50.
1067.77	4 ⁺	182.60 30		885.17	3 ⁺		
		357.40 20		710.48	2 ⁺		
		545.52 10	67 33	522.32	4 ⁺		
		896.23 10	100 56	171.549	2 ⁺		
1149.84	(2 ⁺)	978.2 3		171.549	2 ⁺		

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Adopted Levels, Gammas (continued) $\gamma(^{106}\text{Mo})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult.	Comments
1149.84	(2 ⁺)	1150.0 3		0.0	0 ⁺		
1279.9		1108.3 5	100	171.549	2 ⁺		
1306.81	5 ⁺	239.1 1		1067.77	4 ⁺		
		273.5 3		1033.34	6 ⁺		
		421.5 2		885.17	3 ⁺		
		784.4 1		522.32	4 ⁺		
1434.73	4 ⁺	367.0 3		1067.77	4 ⁺		
		549.6 1	53 18	885.17	3 ⁺		
		724.5 2	100 35	710.48	2 ⁺		
		912.3 3		522.32	4 ⁺		
		1263.1 3		171.549	2 ⁺		
1536.46	(4 ⁺)	386.7 3		1149.84	(2 ⁺)		
		1014.1 3		522.32	4 ⁺		
		1364.9 3		171.549	2 ⁺		
1563.25	6 ⁺	256.4 3		1306.81	5 ⁺		
		495.6 2		1067.77	4 ⁺		
		529.9 1		1033.34	6 ⁺		
		1041.2 3		522.32	4 ⁺		
1657.64	5 ⁺	223.0 1		1434.73	4 ⁺		
		350.7 3		1306.81	5 ⁺		
		589.9 1		1067.77	4 ⁺		
		772.4 1		885.17	3 ⁺		
1688.26	8 ⁺	654.9 1	100	1033.34	6 ⁺	[E2]	B(E2)(W.u.)=89 12
1817.22	(3 ⁻)	931.6 3		885.17	3 ⁺		
		1107.0 3		710.48	2 ⁺		
1868.08	7 ⁺	305.5 [#]		1563.25	6 ⁺		
		561.2 2		1306.81	5 ⁺		
		834.8 2		1033.34	6 ⁺		
1910.30	6 ⁺	252.5 2		1657.64	5 ⁺		
		475.4 2		1434.73	4 ⁺		
		603.5 1		1306.81	5 ⁺		
		842.5 1		1067.77	4 ⁺		
1936.82	(4 ⁻)	119.5 3		1817.22	(3 ⁻)		
		869.1 1		1067.77	4 ⁺		
		1051.6 1		885.17	3 ⁺		
		1414.4 3		522.32	4 ⁺		
1952.20	(5 ⁻)	294.6 3		1657.64	5 ⁺		
		517.5 1		1434.73	4 ⁺		
		884.4 3		1067.77	4 ⁺		
2014.73	(6 ⁺)	478.3 3		1536.46	(4 ⁺)		
		981.3 3		1033.34	6 ⁺		
		1492.4 3		522.32	4 ⁺		
2090.40	(5 ⁻)	153.6 3		1936.82	(4 ⁻)		
		273.1 3		1817.22	(3 ⁻)		
		783.6 3		1306.81	5 ⁺		
		1022.6 3		1067.77	4 ⁺		
		1057.1 3		1033.34	6 ⁺		
2142.50	(6 ⁻)	190.4 2		1952.20	(5 ⁻)		
		231.7 3		1910.30	6 ⁺		
		484.8 3		1657.64	5 ⁺		
2146.81	(5 ⁻)	1113.5 3		1033.34	6 ⁺		
		1624.4 3		522.32	4 ⁺		
2194.27	8 ⁺	326.1		1868.08	7 ⁺		
		506.2 4		1688.26	8 ⁺		E_γ : 508.9 from 2002Ha46 in ^{252}Cf SF decay.
		631.0 1		1563.25	6 ⁺		

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Adopted Levels, Gammas (continued) $\gamma(^{106}\text{Mo})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult.	Comments
2194.27	8 ⁺	1160.9 2		1033.34	6 ⁺		E_γ : 1162.6 from 2002Ha46 in ^{252}Cf SF decay.
2199.66	7 ⁺	289.3 1		1910.30	6 ⁺		
		542.1 1		1657.64	5 ⁺		
		636.4 3		1563.25	6 ⁺		
		892.8 3		1306.81	5 ⁺		
2276.32	(6 ⁻)	185.9 3		2090.40	(5 ⁻)		
		339.4 2		1936.82	(4 ⁻)		
		713.1 1		1563.25	6 ⁺		
		969.5 1		1306.81	5 ⁺		
		1243.0 1		1033.34	6 ⁺		
2302.71	(5 ⁺)	1269.4 3		1033.34	6 ⁺		
		1780.3 3		522.32	4 ⁺		
2368.89	(7 ⁻)	226.5 2		2142.50	(6 ⁻)		
		416.7 1		1952.20	(5 ⁻)		
		458.6 4		1910.30	6 ⁺		
2472.4	10 ⁺	784.1 3	100	1688.26	8 ⁺	[E2]	B(E2)(W.u.)=93 13
2498.84	(7 ⁻)	222.5 1		2276.32	(6 ⁻)		
		408.4 3		2090.40	(5 ⁻)		
		935.6 1		1563.25	6 ⁺		
2520.93	8 ⁺	321.3 3		2199.66	7 ⁺		
2559.2	9 ⁺	610.6 3		1910.30	6 ⁺		E_γ : 869.8 (2002Ha46) in ^{252}Cf SF decay.
		690.9 5		1868.08	7 ⁺		
		871.0 3		1688.26	8 ⁺		
2565.98	(8 ⁺)	551.2 3		2014.73	(6 ⁺)		
		877.7 1		1688.26	8 ⁺		
		1532.7 2		1033.34	6 ⁺		E_γ : 876.7 (2002Ha46) in ^{252}Cf SF decay. E_γ : 1531.6 (2002Ha46) in ^{252}Cf SF decay.
2566.04	(7 ⁻)	419.2 3		2146.81	(5 ⁻)		
		877.8 3		1688.26	8 ⁺		
		1532.7 3		1033.34	6 ⁺		
2629.14	(8 ⁻)	260.4 3		2368.89	(7 ⁻)		
		430.3 6		2199.66	7 ⁺		E_γ : 429.7 from 2002Ha46 in ^{252}Cf SF decay.
		486.4 2		2142.50	(6 ⁻)		
2713.15	(7 ⁺)	410.4 3		2302.71	(5 ⁺)		
		1024.9 3		1688.26	8 ⁺		
		1679.8 3		1033.34	6 ⁺		
2746.50	(8 ⁻)	247.9 [#]		2498.84	(7 ⁻)		E_γ : 881.6 from 2002Ha46 in ^{252}Cf SF decay.
		470.2 1		2276.32	(6 ⁻)		
		878.6 4		1868.08	7 ⁺		
		1058.2 1		1688.26	8 ⁺		
2877.5	9 ⁺	677.8 3		2199.66	7 ⁺		
2921.37	(9 ⁻)	292.2 1		2629.14	(8 ⁻)		E_γ : 552.8 from 2002Ha46 in ^{252}Cf SF decay.
		552.5 1		2368.89	(7 ⁻)		
2950.72	10 ⁺	756.4 3		2194.27	8 ⁺		
		1262.5 3		1688.26	8 ⁺		
3041.5	(9 ⁻)	295.0 [#]		2746.50	(8 ⁻)		
		542.7 3		2498.84	(7 ⁻)		
3132.2	(9 ⁻)	566.1 3		2566.04	(7 ⁻)		
		1443.9 3		1688.26	8 ⁺		
3184.8	(10 ⁺)	618.8 3		2565.98	(8 ⁺)		
3238.35	(10 ⁻)	317.0 3		2921.37	(9 ⁻)		
		609.2 2		2629.14	(8 ⁻)		
3253.7	(9 ⁺)	540.5 3		2713.15	(7 ⁺)		
		1565.4 3		1688.26	8 ⁺		
3263.9	10 ⁺	743.0 3		2520.93	8 ⁺		

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Adopted Levels, Gammas (continued) $\gamma(^{106}\text{Mo})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	E_f	J_f^π	Mult.	Comments
3349.7	(10 ⁻)	308 [#]	3041.5	(9 ⁻)		
		603.2 3	2746.50	(8 ⁻)		E_γ : 604.0 (2002Ha46) in ^{252}Cf SF decay.
3369.1	12 ⁺	896.7 5	2472.4	10 ⁺	[E2]	B(E2)(W.u.)=89 10
3369.6	11 ⁺	810.4 10	2559.2	9 ⁺		
3591.9	(11 ⁻)	670.5 3	2921.37	(9 ⁻)		
3682.2	11 ⁺	804.7 3	2877.5	9 ⁺		
3707.6	(11 ⁻)	666.0 3	3041.5	(9 ⁻)		
3810.5	12 ⁺	859.8 10	2950.72	10 ⁺		
3843.6	(11 ⁻)	711.4 3	3132.2	(9 ⁻)		
3928.5	(11 ⁺)	674.8 3	3253.7	(9 ⁺)		
3945.3	(12 ⁻)	353.5 [#]	3591.9	(11 ⁻)		
		706.9	3238.35	(10 ⁻)		
4049.3	(12 ⁻)	699.6 [#]	3349.7	(10 ⁻)		
4132.5	(12 ⁺)	868.6 3	3263.9	10 ⁺		
4291.9	13 ⁺	922.3 10	3369.6	11 ⁺		
4362.0	14 ⁺	992.9 10	3369.1	12 ⁺		
4371.8	(13 ⁻)	779.9	3591.9	(11 ⁻)		
4596.1	13 ⁺	913.9 20	3682.2	11 ⁺		
4751.4	14 ⁺	941.8 20	3810.5	12 ⁺		
4752.1	(14 ⁻)	806.8 [#]	3945.3	(12 ⁻)		
4756.3	14 ⁺	945.8 6	3810.5	12 ⁺		
5307.3	15 ⁺	1017.3 20	4291.9	13 ⁺		
5412.8	16 ⁺	1051.5 20	4362.0	14 ⁺		
5425.2	16 ⁺	1064.2	4362.0	14 ⁺		
5766.8	16 ⁺	1015.4 20	4751.4	14 ⁺		
6392?	17 ⁺	1085.0 [@] 20	5307.3	15 ⁺		
6501	18 ⁺	1087.6 20	5412.8	16 ⁺		
6867	18 ⁺	1100.6 20	5766.8	16 ⁺		
7660	20 ⁺	1160.4 20	6501	18 ⁺		

[†] γ energies calculated as weighted averages of values from ^{106}Nb β -decay, ^{248}Cm SF Decay and ^{252}Cf SF Decay.

[‡] Branching ratios are from ^{106}Nb β^- decay.

[#] From ^{252}Cf SF Decay (2006Jo05).

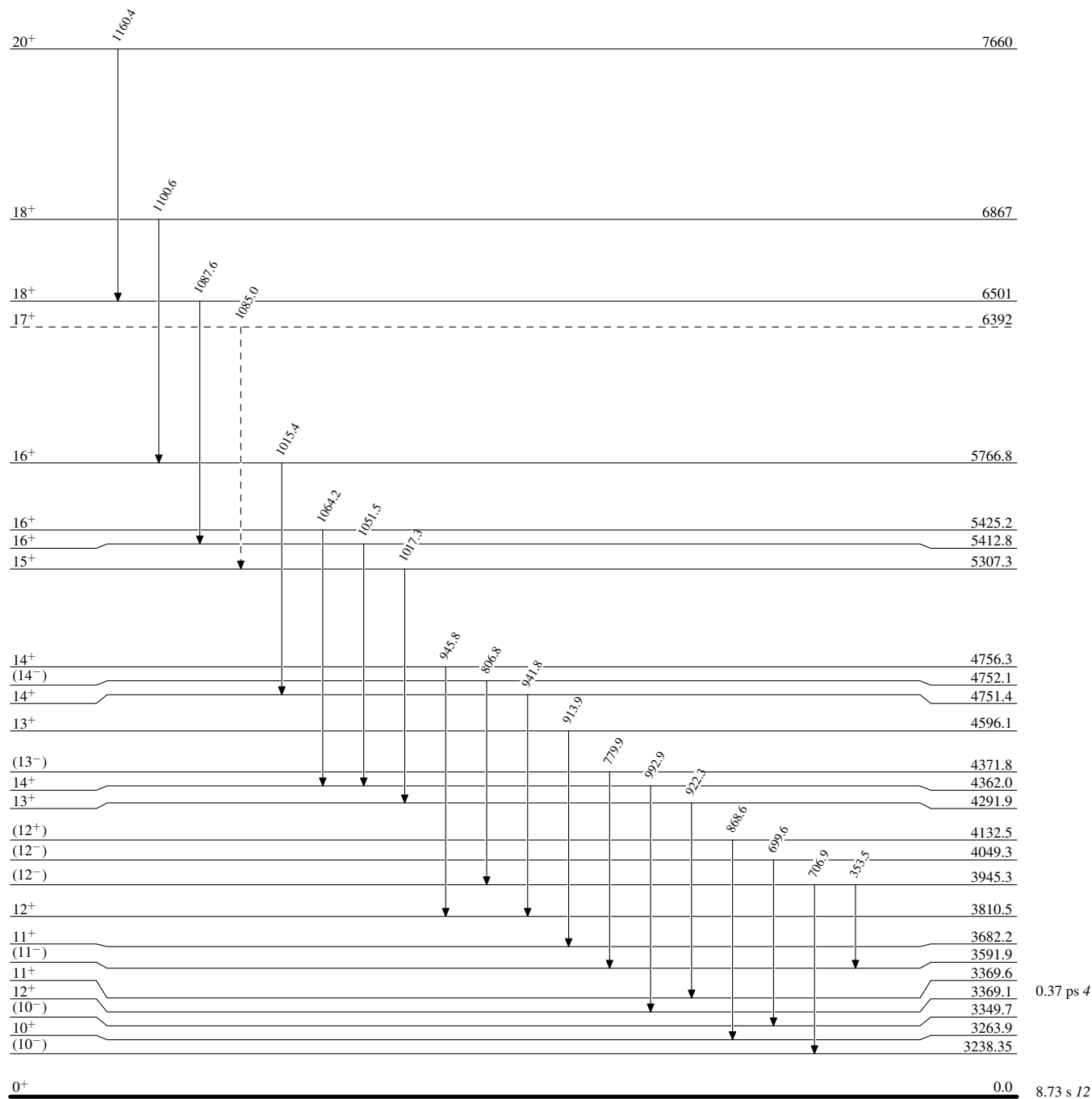
[@] Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

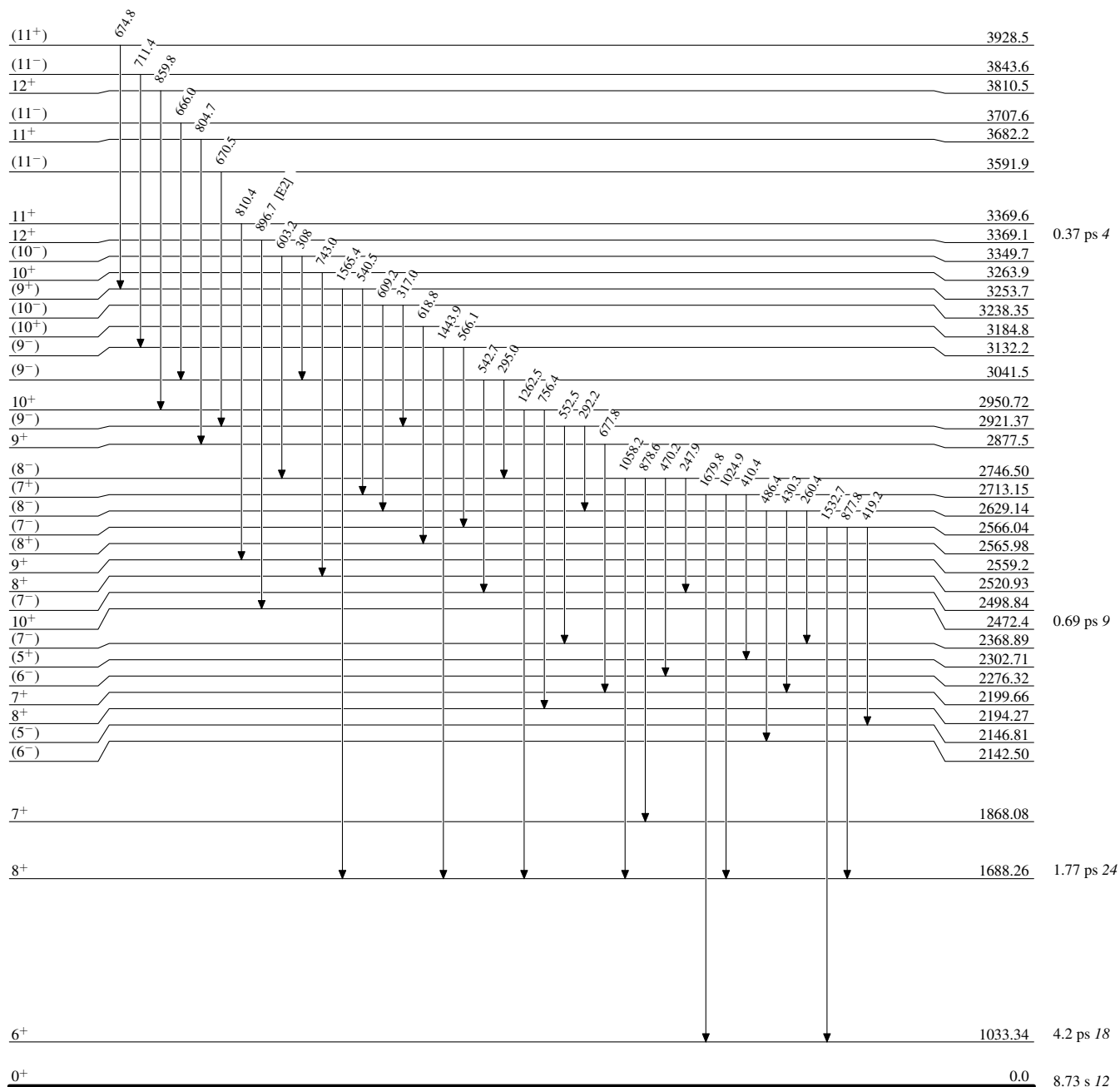
Level Scheme

Intensities: Type not specified

-----► γ Decay (Uncertain)

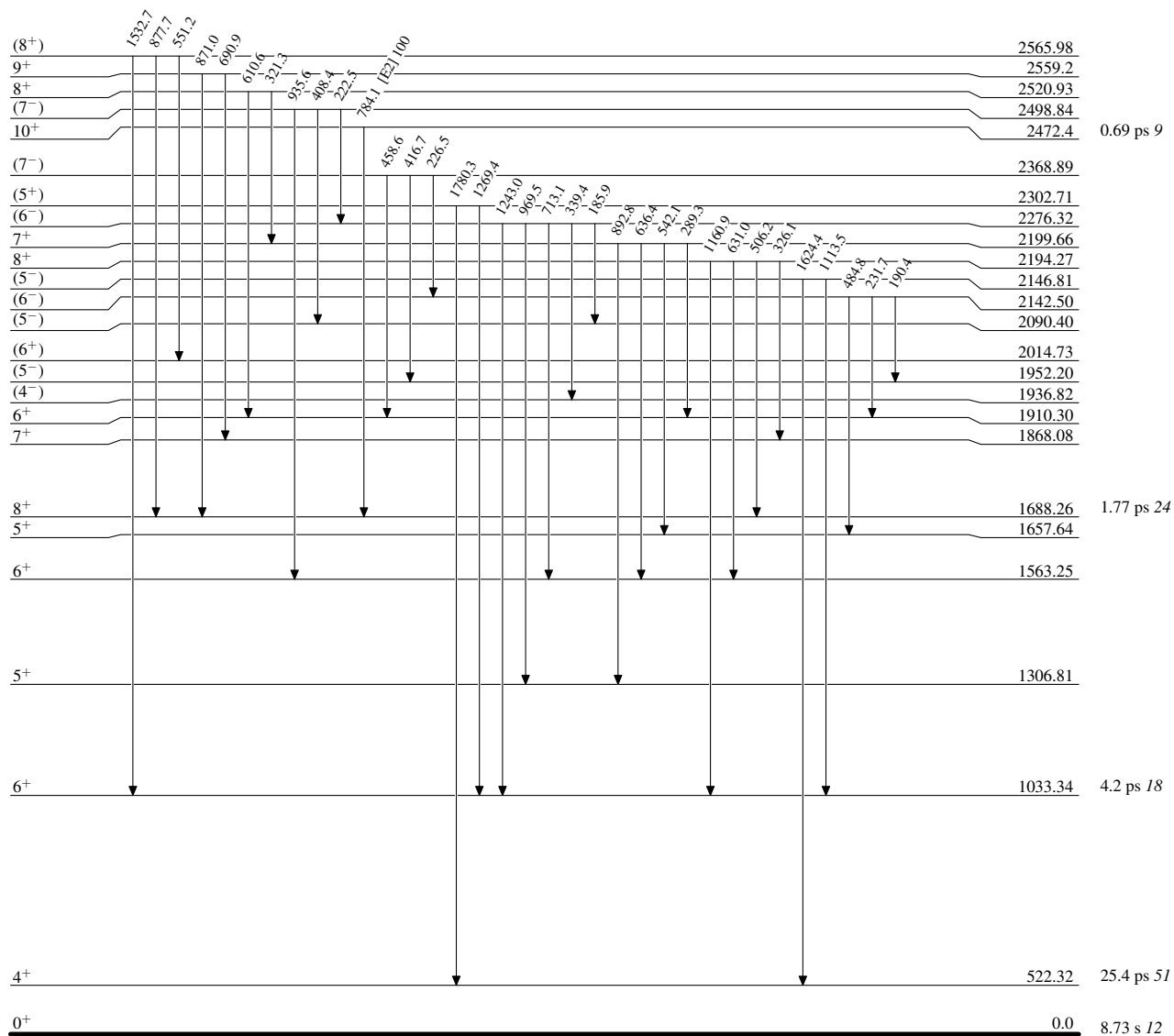
Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Type not specified



Adopted Levels, GammasLevel Scheme (continued)

Intensities: Type not specified

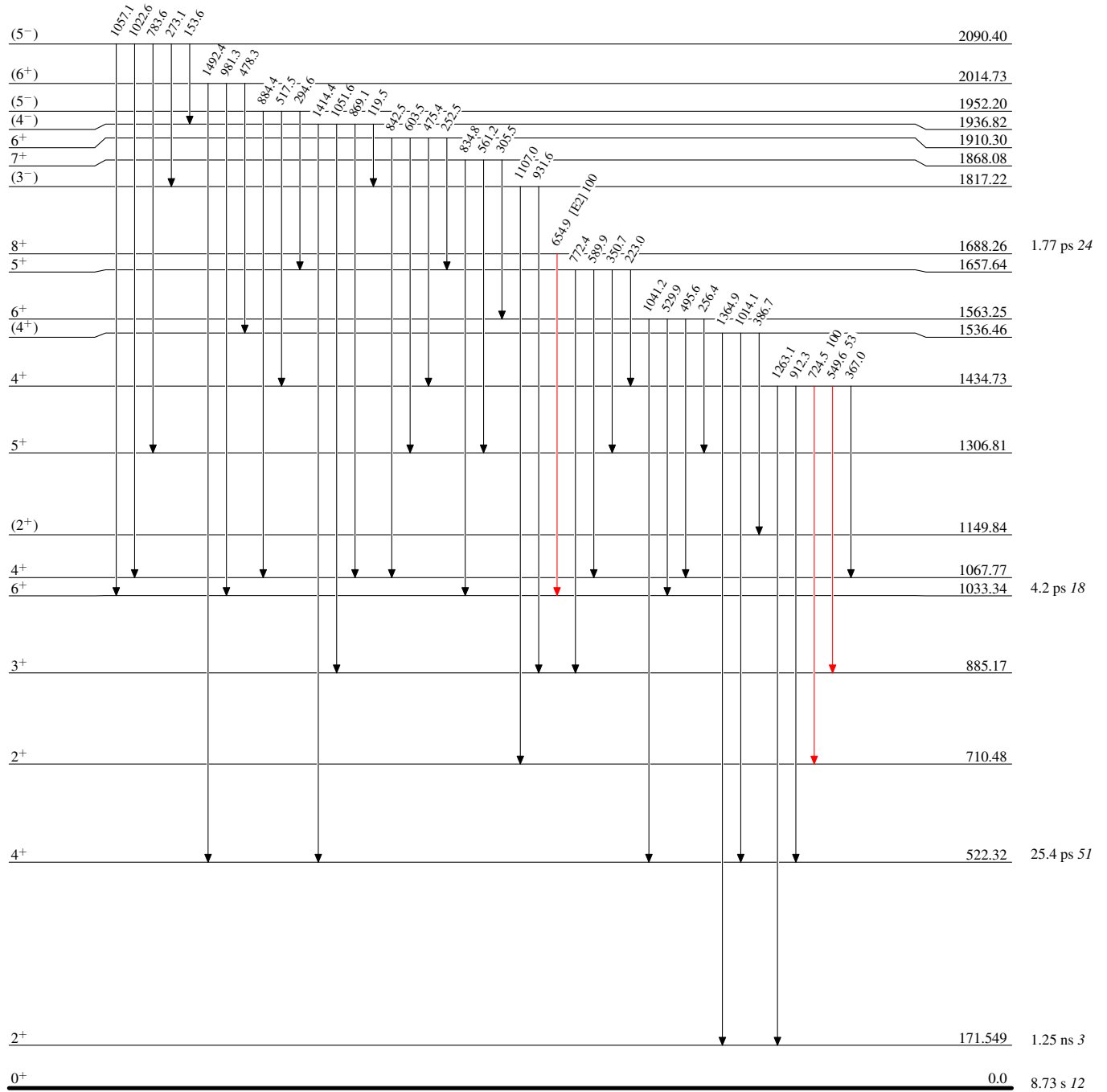


Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Type not specified

Legend

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

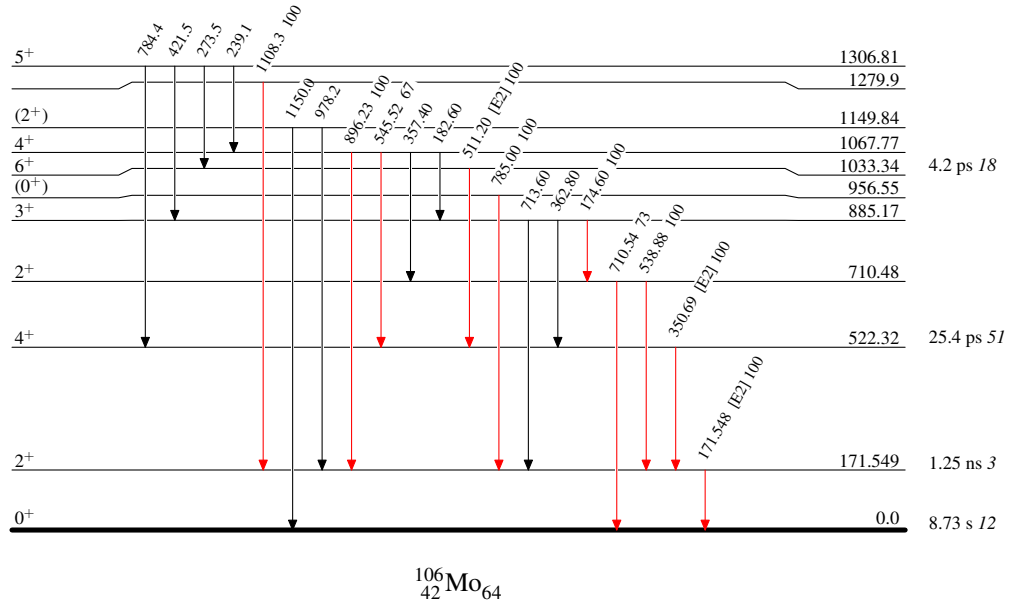


Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Type not specified

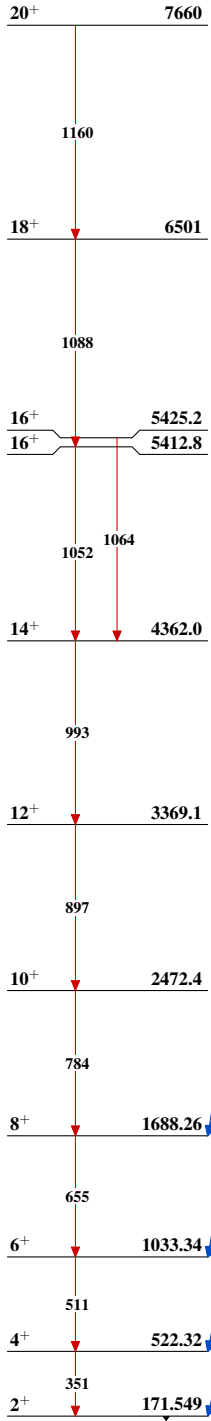
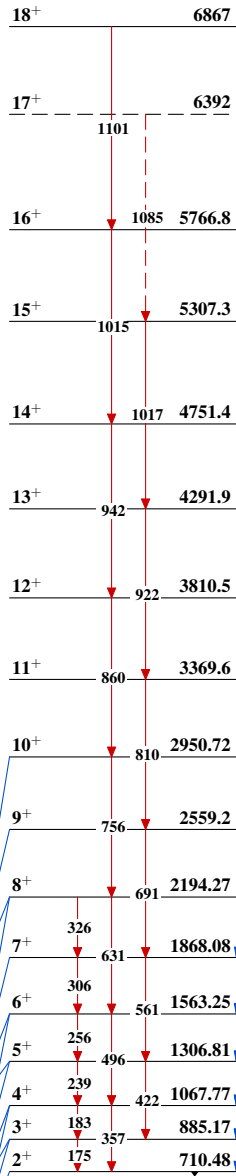
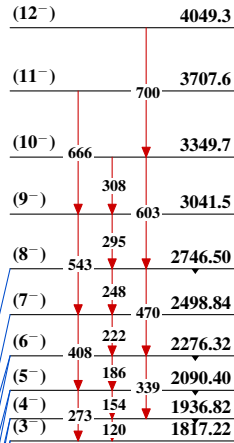
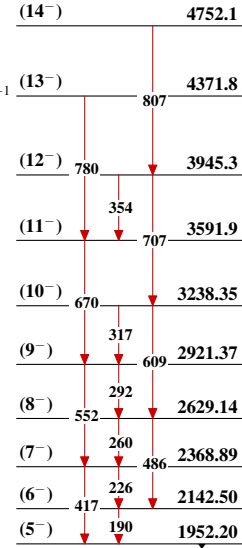
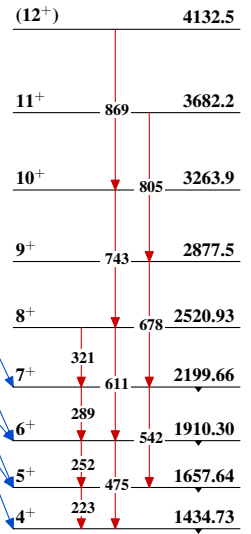
Legend

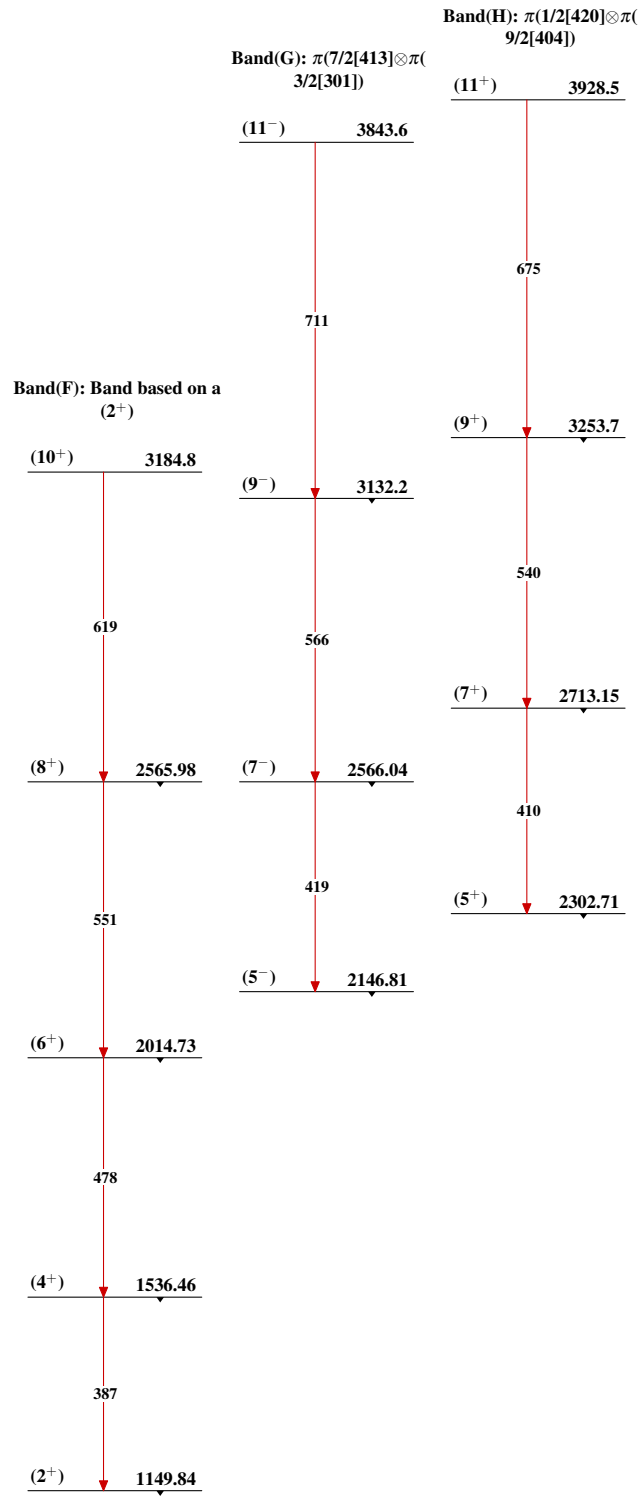
-  $I_\gamma < 2\% \times I_\gamma^{\max}$
 $I_\gamma < 10\% \times I_\gamma^{\max}$
 $I_\gamma > 10\% \times I_\gamma^{\max}$

 $^{106}_{42}\text{Mo}_{64}$

Adopted Levels, Gammas

Band(A): g.s., Yrast band

Band(B): γ bandBand(C): $\nu(3/2[411] \otimes \nu(3/2)[541])^{-1}$ Band(D): $\nu(5/2[413] \otimes \nu(5/2)[532])$ Band(E): $\gamma\gamma$ phonon band

Adopted Levels, Gammas (continued) $^{106}_{42}\text{Mo}_{64}$