Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne	NDS 110, 2081 (2009)	1-Mar-2009

Q(β^-)=3635 *14*; S(n)=5468 *13*; S(p)=11945 *10*; Q(α)=−5767 *14* 2012Wa38
Note: Current evaluation has used the following Q record.
Q-=3635 13 (2007Ha32) using Penning trap at IGISOL.
Q(β^-)=3750 *60*; S(n)=5360 *60*; S(p)=11790 *70*; Q(α)=−5500 *60* 2003Au03

^{103}Mo Levels

The transitional quadrupole moment Q_t were obtained from γ half-life measurements (1993Li28).

Cross Reference (XREF) Flags

A ^{103}Nb β^- decay
B ^{238}U(α,Fγ)
C ^{252}Cf SF decay

E(level)†	J$^\pi$#	$T_{1/2}$‡	XREF	Comments
0.0@	(3/2$^+$)	67.5 s *15*	ABC	%β^-=100 $T_{1/2}$: from γ-decay curves (1977Ti02). Others: 1963Ki12, 1969Ha59, 1976KaYO. J$^\pi$: 1984Sh03 and 1993Li28 suggest g.s. is 3/2[411] Nilsson state.
102.561& *3*	(5/2$^+$)	435 ps *14*	ABC	β_2=0.34 *1* (1993Li28) μ=+0.14 *3* (2006Or05) Transitional quadrupole moment Q_t=3.84 *17* (1993Li28) other: if K=3/2, Q_t=3.80 *18* and β_2=0.34 *2* (only absolute values given) (1985Se02,1990LiZT). $T_{1/2}$: from 1990LiZT in SF decay. Others: 0.45 ns *16* (1985Se02), 1.7 ns *3* (1981SeZW).
241.09@ *6*	(7/2$^+$)	108 ps *16*	ABC	β_2=0.33 *3* (1993Li28) μ=−0.11 *45* (2006Or05) Transitional quadrupole moment Q_t=3.7 *3* (1993Li28).
346.53a *7*	(5/2$^-$)		ABC	
353.74b *9*	(7/2$^-$)	1.2 ns *1*	ABC	μ=−0.33 *11* (2006Or05) J$^\pi$: J^π=9/2$^+$ as suggested by 1984Sh03 excluded due to measured $T_{1/2}$ for that level.
433.23& *15*	(9/2$^+$)	35 ps *24*	ABC	β_2=0.30 *12* (1993Li28) Transitional quadrupole moment Q_t=3.4 *14* (1993Li28).
456.06 *6*		24 ps *10*	A	
478.50a *20*	(9/2$^-$)	<10 ps	BC	
489.83 *13*			A	
498.2b *5*	(11/2$^-$)		BC	μ<0 (2006Or05)
526.13 *9*			A	
637.8@ *7*	(11/2$^+$)		BC	
641.08 *7*			A	
687.44 *13*			A	
692.78 *15*			A	
746.20 *11*		<10 ps	A	
850.8a *4*	(13/2$^-$)		BC	
861.8b *6*	(15/2$^-$)		BC	
901.7& *8*	(13/2$^+$)		BC	
967.09 *9*			A	

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Adopted Levels, Gammas (continued)

^{103}Mo Levels (continued)

E(level)†	Jπ#	XREF	E(level)†	Jπ#	XREF	E(level)†	Jπ#	XREF
1028.16 *13*		A	2164.4[a] *7*	(21/2$^-$)	BC	4214.0[@] *22*	(31/2$^+$)	B
1156.9[@] *8*	(15/2$^+$)	BC	2491.5[@] *17*	(23/2$^+$)	B	4763.2[&] *22*	(33/2$^+$)	B
1185.71 *13*		A	2934.1[&] *17*	(25/2$^+$)	B	4944.5[a] *19*	(33/2$^-$)	B
1408.9[b] *8*	(19/2$^-$)	BC	2960.7[b] *10*	(27/2$^-$)	BC	4985.9[b] *17*	(35/2$^-$)	B
1426.5[a] *5*	(17/2$^-$)	BC	3018.5[a] *12*	(25/2$^-$)	B	5203.3[@] *24*	(35/2$^+$)	B
1482.0[&] *11*	(17/2$^+$)	B	3303.7[@] *20*	(27/2$^+$)	B	6152.2[b] *20*	(39/2$^-$)	B
1778.6[@] *13*	(19/2$^+$)	B	3797.8[&] *20*	(29/2$^+$)	B	6308[@] *3*	(39/2$^+$)	B
2115.7[b] *8*	(23/2)$^-$	BC	3922.5[b] *14*	(31/2$^-$)	B			
2161.4[&] *13*	(21/2$^+$)	B	3946.9[a] *16*	(29/2$^-$)	B			

† Calculated from a least-squares procedure using γ data from ^{252}Cf SF decay, ^{103}Nb β$^-$ decay. No δE are given for a number of levels observed only in ^{238}U(α,Fγ).

‡ From delayed β-γ measurements (1993Li28).

1984Sh03 and 1993Li28 suggest g.s. is 3/2[411] Nilsson state. The other assignments are based on band considerations in ^{238}U(α,Fγ) and ^{252}Cf SF decay and systematics of other odd mass Mo nuclei.

@ Band(A): ν3/2[411], α=−1/2 (2004Hu02).

& Band(a): ν3/2[411], α=+1/2 (2004Hu02).

a Band(B): ν5/2[532], α=+1/2 (2004Hu02).

b Band(b): ν5/2[532], α=−1/2 (2004Hu02).

γ(^{103}Mo)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.	δ‡	α#	Comments
102.561	(5/2$^+$)	102.561 *3*	100	0.0	(3/2$^+$)	M1+E2	−0.28 *9*	0.30 *5*	B(M1)(W.u.)=0.0435 *25*; B(E2)(W.u.)=2.9×10^2 *18*
241.09	(7/2$^+$)	138.5 *1*	100 *4*	102.561	(5/2$^+$)	M1+E2	−0.15 *3*	0.24 *14*	B(M1)(W.u.)=0.050 *8*; B(E2)(W.u.)=52 *22*
		241.1 *2*	51 *4*	0.0	(3/2$^+$)				
346.53	(5/2$^-$)	244.0 *1*	19 *5*	102.561	(5/2$^+$)				
		346.5 *1*	100 *12*	0.0	(3/2$^+$)				
353.74	(7/2$^-$)	112.7 *2*	43 *7*	241.09	(7/2$^+$)				
		251.18 *9*	100 *1*	102.561	(5/2$^+$)				
433.23	(9/2$^+$)	192.1 *2*	68 *18*	241.09	(7/2$^+$)				
		330.7 *2*	100 *38*	102.561	(5/2$^+$)				
456.06		215.0 *1*	6.1 *16*	241.09	(7/2$^+$)				
		353.4 *1*	57 *7*	102.561	(5/2$^+$)				
		456.2 *1*	100 *11*	0.0	(3/2$^+$)				
478.50	(9/2$^-$)	124.9 *3*	100 *18*	353.74	(7/2$^-$)				
		131.9 *5*	16 *8*	346.53	(5/2$^-$)				
		237.3 *3*	37 *11*	241.09	(7/2$^+$)				
489.83		143.3 *2*	100 *23*	346.53	(5/2$^-$)				
		387.2 *2*	54 *23*	102.561	(5/2$^+$)				
		490.0 *3*	69 *31*	0.0	(3/2$^+$)				
498.2	(11/2$^-$)	144.5	100	353.74	(7/2$^-$)	(E2)		0.318 *5*	α(K)exp=0.32 *10* α(K)exp from (1991Ho16).
526.13		423.6 *2*	60 *14*	102.561	(5/2$^+$)				
		526.1 *1*	100 *16*	0.0	(3/2$^+$)				
637.8	(11/2$^+$)	204.5	27	433.23	(9/2$^+$)				

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Adopted Levels, Gammas (continued)

γ(^{103}Mo) (continued)

E_i(level)	J_i^π	E_γ †	I_γ †	E_f	J_f^π
637.8	(11/2$^+$)	397.0	100	241.09	(7/2$^+$)
641.08		538.5 *1*	62 *4*	102.561	(5/2$^+$)
		641.1 *1*	100 *5*	0.0	(3/2$^+$)
687.44		446.2 *2*	31 *5*	241.09	(7/2$^+$)
		585.0 *2*	73 *15*	102.561	(5/2$^+$)
		687.5 *3*	100 *23*	0.0	(3/2$^+$)
692.78		236.8 *2*	89 *22*	456.06	
		451.3 *3*	52 *8*	241.09	(7/2$^+$)
		590.4 *3*	100 *22*	102.561	(5/2$^+$)
746.20		505.1 *1*	67 *6*	241.09	(7/2$^+$)
		643.6 *3*	28 *6*	102.561	(5/2$^+$)
		746.3 *3*	100 *9*	0.0	(3/2$^+$)
850.8	(13/2$^-$)	352.7 *3*	74 *35*	498.2	(11/2$^-$)
		372.3 *3*	100 *30*	478.50	(9/2$^-$)
861.8	(15/2$^-$)	363.1	100	498.2	(11/2$^-$)
901.7	(13/2$^+$)	263.8	36	637.8	(11/2$^+$)
		468.3	100	433.23	(9/2$^+$)
967.09		440.9 *2*	25 *5*	526.13	
		864.5 *2*	32 *10*	102.561	(5/2$^+$)
		967.1 *1*	100 *16*	0.0	(3/2$^+$)
1028.16		572.2 *2*	100 *15*	456.06	
		787.3 *4*	18 *10*	241.09	(7/2$^+$)
		925.5 *2*	56 *15*	102.561	(5/2$^+$)
		1028.0 *3*	59 *15*	0.0	(3/2$^+$)
1156.9	(15/2$^+$)	255.0 *5*		901.7	(13/2$^+$)
		519.2	100	637.8	(11/2$^+$)
1185.71		729.7 *2*	100 *27*	456.06	
		945.1 *4*	32 *18*	241.09	(7/2$^+$)
		1083.0 *3*	91 *27*	102.561	(5/2$^+$)
		1185.6 *2*	55 *27*	0.0	(3/2$^+$)
1408.9	(19/2$^-$)	547.0	100	861.8	(15/2$^-$)
1426.5	(17/2$^-$)	564.5 *5*	27 *13*	861.8	(15/2$^-$)
		575.7 *3*	100 *29*	850.8	(13/2$^-$)
1482.0	(17/2$^+$)	324.2		1156.9	(15/2$^+$)
		581.3		901.7	(13/2$^+$)
1778.6	(19/2$^+$)	296.6		1482.0	(17/2$^+$)
2115.7	(23/2)$^-$	706.8 *3*	100	1408.9	(19/2$^-$)
2161.4	(21/2$^+$)	382.8		1778.6	(19/2$^+$)
		679.4		1482.0	(17/2$^+$)
2164.4	(21/2$^-$)	738.0 *5*	100 *53*	1426.5	(17/2$^-$)
		755.5 *5*	76 *41*	1408.9	(19/2$^-$)
2491.5	(23/2$^+$)	712.9		1778.6	(19/2$^+$)
2934.1	(25/2$^+$)	772.7		2161.4	(21/2$^+$)
2960.7	(27/2$^-$)	845.0 *5*	100	2115.7	(23/2)$^-$
3018.5	(25/2$^-$)	854.1		2164.4	(21/2$^-$)
3303.7	(27/2$^+$)	812.2		2491.5	(23/2$^+$)
3797.8	(29/2$^+$)	863.7		2934.1	(25/2$^+$)
3922.5	(31/2$^-$)	961.8		2960.7	(27/2$^-$)
3946.9	(29/2$^-$)	928.3		3018.5	(25/2$^-$)
4214.0	(31/2$^+$)	910.3		3303.7	(27/2$^+$)
4763.2	(33/2$^+$)	965.3		3797.8	(29/2$^+$)
4944.5	(33/2$^-$)	997.6		3946.9	(29/2$^-$)
4985.9	(35/2$^-$)	1063.4		3922.5	(31/2$^-$)
5203.3	(35/2$^+$)	989.2		4214.0	(31/2$^+$)
6152.2	(39/2$^-$)	1166.3		4985.9	(35/2$^-$)
6308	(39/2$^+$)	1104.5		5203.3	(35/2$^+$)

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Adopted Levels, Gammas (continued)

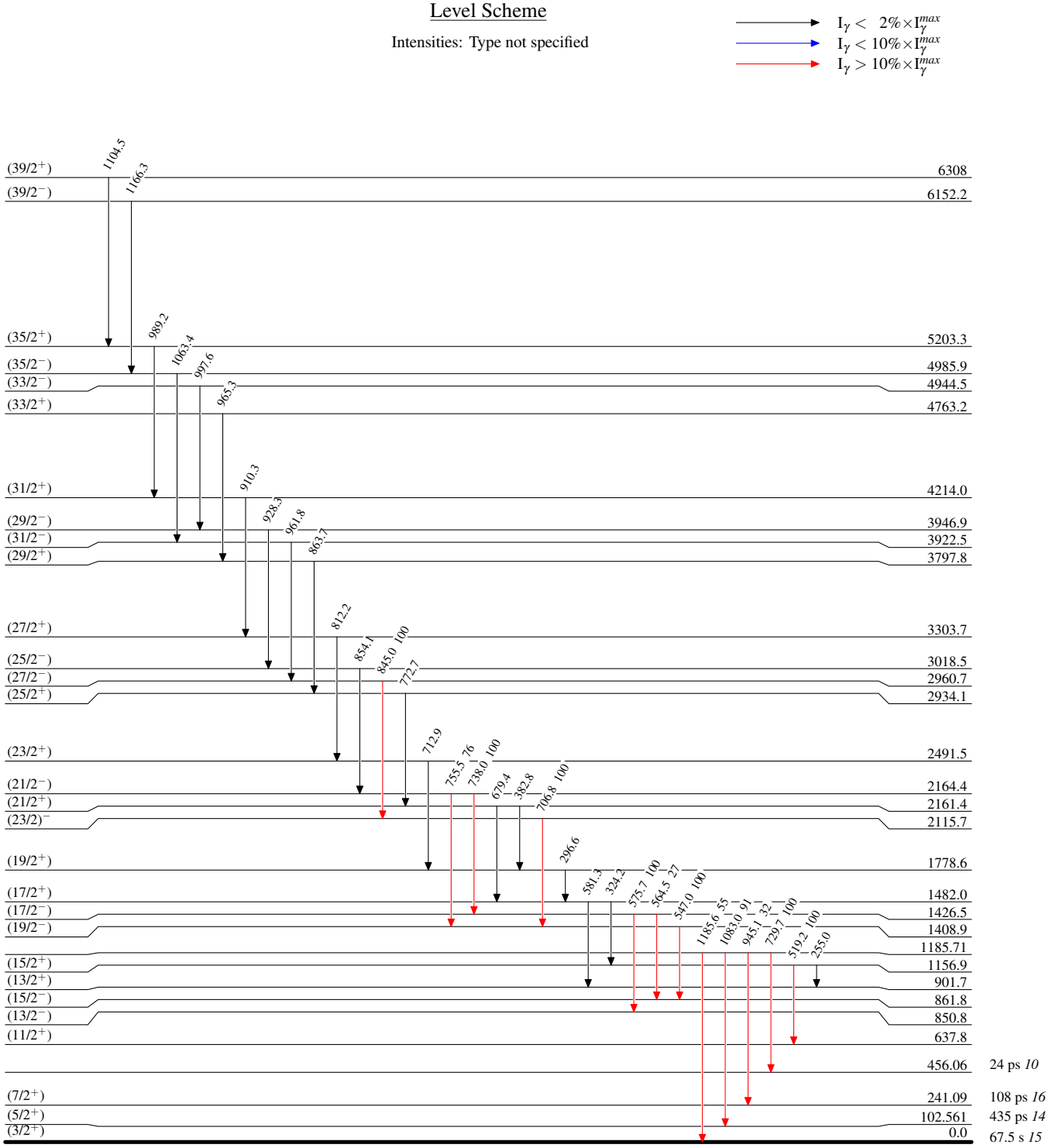
$\gamma(^{103}Mo)$ (continued)

† Taken from ^{252}Cf SF decay and/or ^{103}Nb β^- decay data.
‡ From ^{252}Cf SF decay (2006Or05).
# Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified

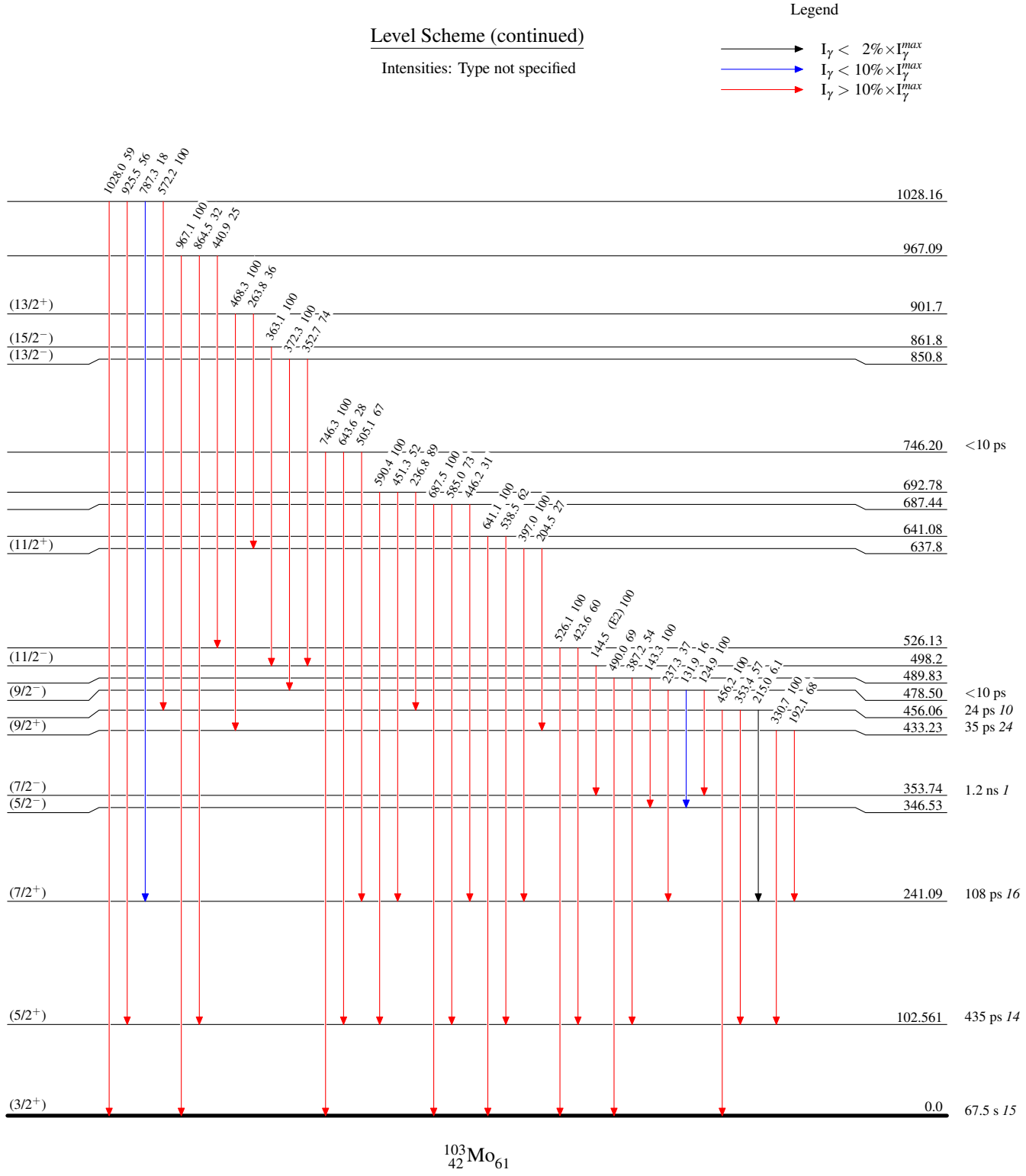


$^{103}_{42}Mo_{61}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



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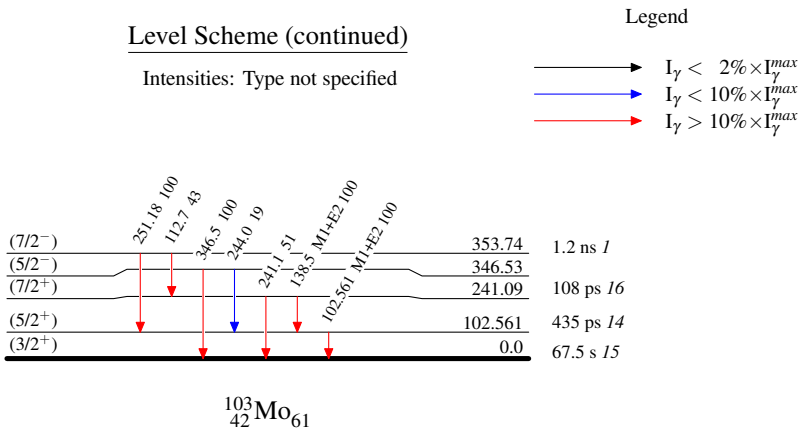
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



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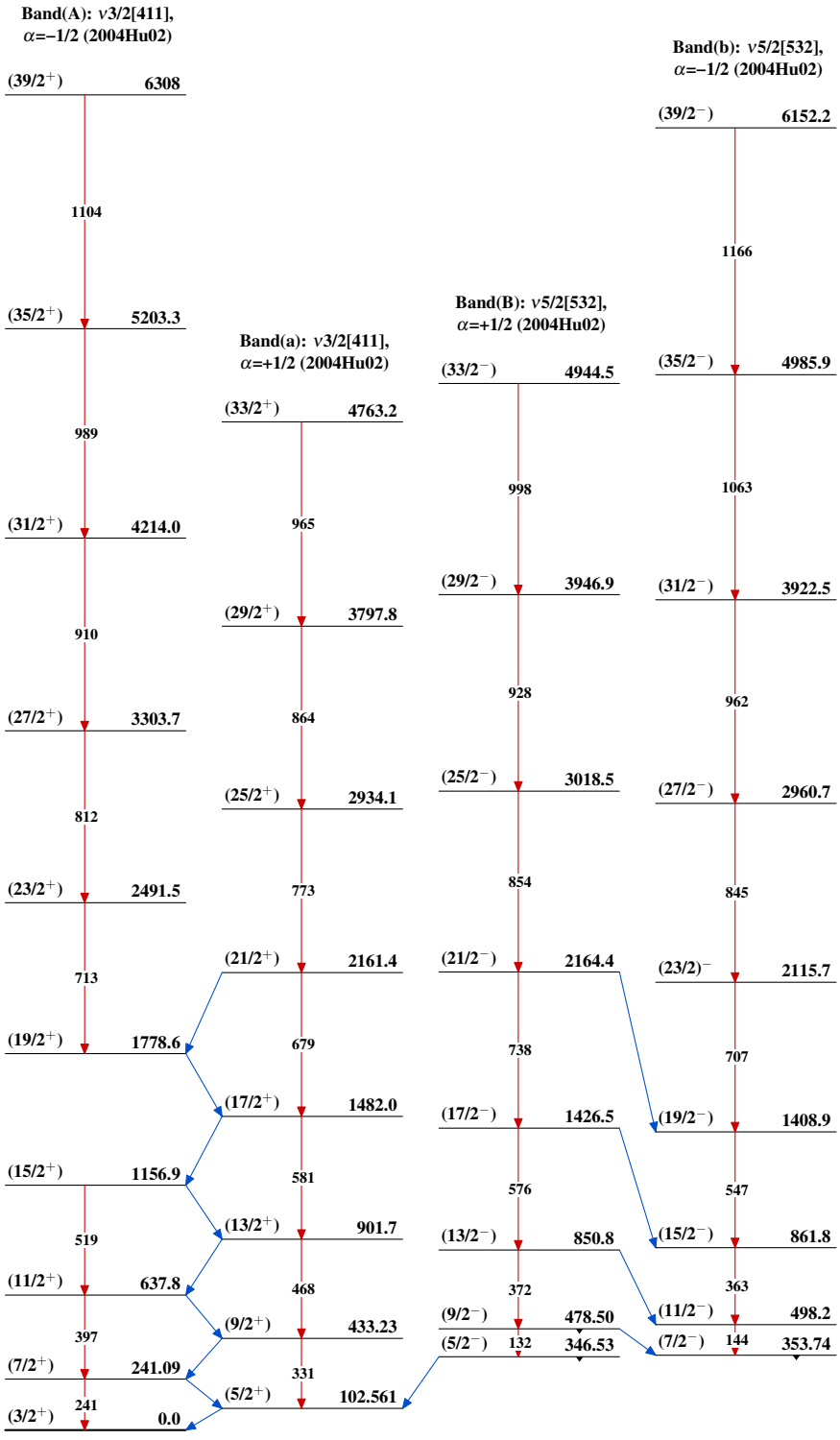
Adopted Levels, Gammas



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