

Adopted Levels, Gammas

Type	History		Literature Cutoff Date
	Author	Citation	
Full Evaluation	Jean Blachot	ENSDF	1-Jul-2006

$Q(\beta^-)=2825.24$; $S(n)=5398.24$ 7; $S(p)=11002.9$ 9; $Q(\alpha)=-2992.9$ 23 [2012Wa38](#)

Note: Current evaluation has used the following Q record 2825 255398.24 7 10861 25-2990 6 [2003Au03](#).

 ^{101}Mo LevelsCross Reference (XREF) Flags

A	^{101}Nb β^- decay (7.1 s)	E	$^{100}\text{Mo}(\text{d,p})$, (pol d,p)
B	$^{100}\text{Mo}(\text{n},\gamma)$ E=th:secondary	F	$^{100}\text{Mo}(\text{t,d})$
C	$^{100}\text{Mo}(\text{n},\gamma)$ E=res	G	$^{100}\text{Mo}(^{136}\text{Xe}, ^{135}\text{Xe})$
D	$^{100}\text{Mo}(\text{n},\gamma)$ E=th: primary		

E(level)	J^π	$T_{1/2}$	XREF	Comments
0.0	$1/2^+$	14.61 min 3	ABCDEFG	$\% \beta^- = 100$ J^π : L=0 (d,p). $T_{1/2}$: weighted average of: 14.61 3 (1990Ab06), 14.6 min (1941Ma03), 14.6 min 1 (1954Wi04), 14.61 min 7 (1957Ok01), 14.77 min 16 (1972Co17).
13.497 9	$3/2^+$	226 ns 7	ABC EF	J^π : M1(+E2) γ to $1/2^+$, M1+E2 γ from $5/2^+$. $T_{1/2}$: from (276 γ)(13.5 γ)(t): (1991Se08). Other: 223 ns 10 (1977LaZG).
57.015 11	$5/2^+$ †	133 ns 70	ABC EFG	$T_{1/2}$: from (180 γ)(K α x ray)(t) (1991Se08). Others: 124 ns 10 (1977LaZG) (semi), 12.5 ns (1965Mc03). E(level): 1991Se08 have looked for the possibility of a state near 57 keV without success. See (d,p).
170.958 14	$5/2^+$	95 ns 15	ABC EF	J^π : L=2,3 (d,p), av res favors $5/2^+$.
237.732 15	$3/2^+, 5/2^+$		AB E	J^π : L=2 (d,p).
240.5 10	$7/2^+$ †		B EF	
273.† 2	$11/2^-$		EF	J^π : L=5 (d,p).
289.531 17	$3/2^+$ †		ABC EF	
293.79 3	$1/2^+, 3/2, 5/2^+$		B	J^π : γ decays.
294.586 16	$1/2^+$		BCDE	J^π : L=0 (d,p).
315 3	$7/2, 9/2^+$		B E	J^π : L=3,4 (d,p), weak feeding in (n, γ) rules out $5/2^-$.
318.858 18	$(5/2)^+$		ABC	J^π : M1+E2 γ to $3/2^+, 5/2^+$, av res favors $(5/2)^+$.
351.589 19	$3/2^+$ †		ABC EF	
449 1	$1/2^+$		F	J^π : L=0 (t,d).
454.55 4	$5/2^+$		ABC E	J^π : L=2 (d,p), not seen in (pol d,p).
479.78 4	$3/2^+$ †		ABC EF	
540.05 4	$1/2^+$		BC EF	J^π : L=0 (d,p).
563.5 10	$9/2^-, 11/2^-$		B E	J^π : L=5 (d,p).
567.55 3	$5/2^+$ †		ABC EF	
568.85 6	$1/2^+$		B DE	J^π : L=0 (d,p).
583.39 12	$7/2^+, 9/2^+$		BC EF	J^π : L=4 (d,p).
586.47 12	$1/2, 3/2, 5/2^+$		B	J^π : γ 's to $1/2^+$.
626.36 5	$7/2, 9/2^+$		B	J^π : not fed by primary gammas, γ to $3/2^+, 5/2^+$.
702.0† 20	$15/2^-$		G	
709.98 3	$(1/2^+)$		BC E	J^π : L=(0) (d,p).
797.16 8	$1/2^+, 3/2, 5/2$		BC e	J^π : Fed from $3/2^-$ resonance in (n, γ), γ to $5/2^+$, L(d,p)=(1) for the 797 and/or the 811 levels.
810.60 6	$(1/2^-, 3/2^-)$		AB e	J^π : γ 's to $1/2^+$ and $5/2^+$, see also the 797 level.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{101}Mo Levels (continued)

E(level)	J^π	XREF	Comments
823.09 5	$1/2^+, 3/2^+, 5/2^+$	BC	J^π : γ 's to $1/2^+$ and $5/2^+$. Strong feeding from a $\pi=-$ resonance (n, γ).
830.43 7	$7/2^+, 9/2^+$	B EF	J^π : L=4 (d,p).
854.07 8	$1/2^+, 3/2^+, 5/2^+$	ABCD	J^π : γ 's to $1/2^+$ and $5/2^+$. Strong feeding from a $\pi=-$ resonance (n, γ).
867.78 8	$3/2^+, 5/2^{+\dagger}$	B EF	XREF: F(863).
902.84 3	$1/2^+, 3/2^+, 5/2^+$	B DE	J^π : γ 's to $1/2^+$ and $5/2^+$.
909.83 8	$3/2^+, 5/2^+$	B	J^π : γ 's to $1/2^+$ and $7/2^+, 9/2^+$.
914.19 13	$7/2^+, 9/2^+$	B EF	XREF: F(911).
			J^π : L=4 (t,d).
974.78 8	$1/2, 3/2, 5/2$	B	J^π : γ 's to $3/2^+$ and $5/2^+$.
984.17 7	$3/2^{+\dagger}$	B EF	
1011.01 6	($1/2^+$)	BCDE	J^π : L=(0) (t,d).
1047.05 21	$1/2^+$	B EF	XREF: F(1042).
			J^π : L=0 (t,d).
1054.34 14	$1/2, 3/2, 5/2$	BC	J^π : γ 's to $1/2^+$.
1098.99 13	$1/2, 3/2$	B D	J^π : γ decay. 1990Se17 rule out $J>3/2$ from their stat. population analysis.
1109.23 7	$3/2^{+\dagger}$	EF	XREF: F(1106).
1116.86 12	$3/2, 5/2$	BC	J^π : γ 's to $1/2^+$ and $7/2^+, 9/2^+$.
1199.41 6	$1/2, 3/2, 5/2, 7/2$	B	J^π : γ 's to $3/2^+$ and $5/2^+$.
1229.84 8	$3/2, 5/2$	B	J^π : γ 's to $1/2^+$ and $7/2^+, 9/2^+$.
1281.22 11	$3/2, 5/2$	BC	J^π : γ 's to $1/2^+$ and $7/2^+, 9/2^+$.
1291.25 9	$3/2^{-\dagger}$	BCDEF	
1318 ‡ 3	$19/2^-$	G	
1334 5	$5/2^{-\dagger}$	EF	
1349.71 9	($1/2, 3/2$)	B D	J^π : from (n, γ).
1447.28 9	$3/2, 5/2$	BCD	J^π : γ 's to $1/2^+$ and $7/2^+, 9/2^+$.
1459.5 12	$9/2^-, 11/2^-$	B DEF	J^π : L=5 (t,d).
1559.9 10		B D	
1620.0 10		B D	
1631.5 5		C	
1636.3 10		BCD	
1687.1 10		B D	
1699.8 10		B D	
1825.7 3		D	
1847.2 10		B D	
1861.2 10		B D	
1978.6 13		B D	
2071.8		C	
2090 ‡ 4	$23/2^-$	G	
2110.3 10		BC	
2981 ‡ 4	$27/2^-$	G	
3962 ‡ 5	$31/2^-$	G	
5031 ‡ 5	$35/2^-$	G	

 † Vector-analyzing power in (pol d,p), π from L in (d,p) and (t,d). ‡ Band(A): Decoupled neutron h11/2 band.

Adopted Levels, Gammas (continued)

$\gamma(^{101}\text{Mo})$									
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	I_γ	E_f	J_f^π	Mult.	δ	$\alpha^\ddagger$	Comments
13.497	3/2 ⁺	13.49 10	100	0.0	1/2 ⁺	M1(+E2)	<0.03	12.3 13	B(M1)(W.u.)>0.0026; B(E2)(W.u.)<15
57.015	5/2 ⁺	43.515 5	100 7	13.497	3/2 ⁺	M1+E2	1.06 13	14.1 13	B(M1)(W.u.)=6.E-5 4; B(E2)(W.u.)=33 19
		56.892 20	5.6 8	0.0	1/2 ⁺	E2		9.2	B(E2)(W.u.)=0.9 5
170.958	5/2 ⁺	113.935 10	6.5 4	57.015	5/2 ⁺				
		157.466 12	100.0 12	13.497	3/2 ⁺				
237.732	3/2 ⁺ ,5/2 ⁺	180.703 19	100.0 18	57.015	5/2 ⁺				
		223.8 3	3.4 8	13.497	3/2 ⁺				
		238.4 5	1.2 7	0.0	1/2 ⁺				
240.5	7/2 ⁺	182.1 5	100	57.015	5/2 ⁺				
289.531	3/2 ⁺	118.556 11	9.3 5	170.958	5/2 ⁺				
		232.4 2	3.5 14	57.015	5/2 ⁺				
		276.10 4	100.0 21	13.497	3/2 ⁺				
		289.63 5	11.8 23	0.0	1/2 ⁺				
293.79	1/2 ⁺ ,3/2,5/2 ⁺	123.0 [#] 3	1.1 [#] 5	170.958	5/2 ⁺				
		236.78 4	34 3	57.015	5/2 ⁺				
		280.25 4	100.0 25	13.497	3/2 ⁺				
		293.81 11	55 13	0.0	1/2 ⁺				
294.586	1/2 ⁺	123.0 [#] 3	0.4 [#] 2	170.958	5/2 ⁺				
		237.55 2	100.0 20	57.015	5/2 ⁺				
		281.05 4	47.9 13	13.497	3/2 ⁺				
		294.59 [@] 4	46 [@] 3	0.0	1/2 ⁺				
315	7/2,9/2 ⁺	143.1 1	100	170.958	5/2 ⁺				
318.858	(5/2) ⁺	81.122 5	53.6 23	237.732	3/2 ⁺ ,5/2 ⁺	M1+E2	0.84 +23-20	1.3 3	
		147.935 18	5.5 13	170.958	5/2 ⁺				
		305.5 2	100 10	13.497	3/2 ⁺				
351.589	3/2 ⁺	37.0 4	1.6 5	315	7/2,9/2 ⁺				
		180.8 3	5.3 13	170.958	5/2 ⁺				
		294.59 [@] 4	100 [@] 8	57.015	5/2 ⁺				
		338.5 3	3.7 8	13.497	3/2 ⁺				
		351.595 15	52 4	0.0	1/2 ⁺				
454.55	5/2 ⁺	164.96 15	4.6 21	289.531	3/2 ⁺				
		216.82 3	12 3	237.732	3/2 ⁺ ,5/2 ⁺				
		283.5 2	22 10	170.958	5/2 ⁺				
		398.0 [@] 3	8 [@] 5	57.015	5/2 ⁺				
		441.01 5	100 10	13.497	3/2 ⁺				
		454.0 3	17 8	0.0	1/2 ⁺				
479.78	3/2 ⁺	185.96 5	15 3	293.79	1/2 ⁺ ,3/2,5/2 ⁺				
		189.8 2	5 3	289.531	3/2 ⁺				
		423.3 4	4 3	57.015	5/2 ⁺				
		466.35 4	100 8	13.497	3/2 ⁺				

Adopted Levels, Gammas (continued) $\gamma(^{101}\text{Mo})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	I_γ	E_f	J_f^π
479.78	3/2 ⁺	480.1 4	65 22	0.0	1/2 ⁺
540.05	1/2 ⁺	188.46 6	6 3	351.589	3/2 ⁺
		526.55 5	100 7	13.497	3/2 ⁺
		540.21 17	58 11	0.0	1/2 ⁺
567.55	5/2 ⁺	277.98 4	51 9	289.531	3/2 ⁺
		329.93 6	43 3	237.732	3/2 ⁺ , 5/2 ⁺
		554.2 5	27 17	13.497	3/2 ⁺
		567.4 3	100 10	0.0	1/2 ⁺
568.85	1/2 ⁺	274.9 2	38 10	293.79	1/2 ⁺ , 3/2, 5/2 ⁺
		331.2 3	10.3 19	237.732	3/2 ⁺ , 5/2 ⁺
		398.0 @ 3	25 @ 15	170.958	5/2 ⁺
		555.34 6	100 7	13.497	3/2 ⁺
583.39	7/2 ⁺ , 9/2 ⁺	412.1 3	100	170.958	5/2 ⁺
586.47	1/2, 3/2, 5/2 ⁺	292.0 2	36 20	294.586	1/2 ⁺
		586.40 14	100 9	0.0	1/2 ⁺
626.36	7/2, 9/2 ⁺	388.59 7	100	237.732	3/2 ⁺ , 5/2 ⁺
702.0	15/2 ⁻	429 2	100	273	11/2 ⁻
709.98	(1/2 ⁺)	140.8 2	40 10	568.85	1/2 ⁺
		230.18 7	45 8	479.78	3/2 ⁺
		358.41 4	72 8	351.589	3/2 ⁺
		415.9 3	47 22	293.79	1/2 ⁺ , 3/2, 5/2 ⁺
		420.43 3	90 13	289.531	3/2 ⁺
		539.6 3	100 25	170.958	5/2 ⁺
797.16	1/2 ⁺ , 3/2, 5/2	317.5 3	55 34	479.78	3/2 ⁺
		507.2 7	39 11	289.531	3/2 ⁺
		559.4 2	34 13	237.732	3/2 ⁺ , 5/2 ⁺
		626.17 10	58 21	170.958	5/2 ⁺
		740.3 2	37 26	57.015	5/2 ⁺
		783.6 3	100 24	13.497	3/2 ⁺
810.60	(1/2 ⁻ , 3/2 ⁻)	355.7 3	9 6	454.55	5/2 ⁺
		459.0 3	62 34	351.589	3/2 ⁺
		639.62 7	72 26	170.958	5/2 ⁺
		753.8 2	25 17	57.015	5/2 ⁺
		810.8 4	100 6	0.0	1/2 ⁺
823.09	1/2 ⁺ , 3/2 ⁺ , 5/2 ⁺	343.4 2	23 5	479.78	3/2 ⁺
		652.5 2	15 3	170.958	5/2 ⁺
		823.08 6	100 25	0.0	1/2 ⁺
830.43	7/2 ⁺ , 9/2 ⁺	204.06 6	100	626.36	7/2, 9/2 ⁺
854.07	1/2 ⁺ , 3/2 ⁺ , 5/2 ⁺	374.6 2	10 6	479.78	3/2 ⁺
		399.0 2	83 33	454.55	5/2 ⁺
		560.3 5	63 27	293.79	1/2 ⁺ , 3/2, 5/2 ⁺

Adopted Levels, Gammas (continued) $\gamma(^{101}\text{Mo})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	I_γ	E_f	J_f^π
854.07	$1/2^+, 3/2^+, 5/2^+$	682.9 2	78 7	170.958	$5/2^+$
		797.10 21	100 8	57.015	$5/2^+$
		840.63 15	57 12	13.497	$3/2^+$
		854.1 2	88 12	0.0	$1/2^+$
867.78	$3/2^+, 5/2^+$	241.38 [#] 5	10 [#] 2	626.36	$7/2, 9/2^+$
		630.1 4	11 6	237.732	$3/2^+, 5/2^+$
		696.2 2	100 20	170.958	$5/2^+$
902.84	$1/2^+, 3/2^+, 5/2^+$	335.34 5	13.9 19	567.55	$5/2^+$
		583.96 3	100 13	318.858	$(5/2)^+$
		608.21 2	89 16	294.586	$1/2^+$
		664.9 2	22 9	237.732	$3/2^+, 5/2^+$
		902.98 10	34 3	0.0	$1/2^+$
909.83	$3/2^+, 5/2^+$	326.45 10	16 5	583.39	$7/2^+, 9/2^+$
		340.5 2	21 5	568.85	$1/2^+$
		369.79 5	70 35	540.05	$1/2^+$
		620.8 [#] 3	21 [#] 5	289.531	$3/2^+$
		853.1 3	100 7	57.015	$5/2^+$
914.19	$7/2^+, 9/2^+$	287.86 11	100 47	626.36	$7/2, 9/2^+$
		620.8 [#] 3	40 [#] 10	293.79	$1/2^+, 3/2, 5/2^+$
		623.4 4	94 6	289.531	$3/2^+$
974.78	$1/2, 3/2, 5/2$	164.0 2	18 8	810.60	$(1/2^-, 3/2^-)$
		737.0 1	90 12	237.732	$3/2^+, 5/2^+$
		918.5 5	100 40	57.015	$5/2^+$
984.17	$3/2^+$	926.3 5	36 18	57.015	$5/2^+$
		970.9 2	100 22	13.497	$3/2^+$
1011.01	$(1/2^+)$	691.7 3	11.9 8	318.858	$(5/2)^+$
		716.41 7	100 6	294.586	$1/2^+$
		997.58 10	5.0 11	13.497	$3/2^+$
1047.05	$1/2^+$	695.0 5	100	351.589	$3/2^+$
1054.34	$1/2, 3/2, 5/2$	231.1 [#] 2	17 [#] 8	823.09	$1/2^+, 3/2^+, 5/2^+$
		760.1 3	31 13	293.79	$1/2^+, 3/2, 5/2^+$
		1054.4 3	100 7	0.0	$1/2^+$
1098.99	$1/2, 3/2$	124.2 2	4 2	974.78	$1/2, 3/2, 5/2$
		231.1 [#] 2	10 [#] 5	867.78	$3/2^+, 5/2^+$
		1042.6 5	100 17	57.015	$5/2^+$
		1084.8 6	22 8	13.497	$3/2^+$
1109.23	$3/2^+$	125.057 11	65 4	984.17	$3/2^+$
		241.38 [#] 5	12.5 [#] 25	867.78	$3/2^+, 5/2^+$
		569.17 7	84 8	540.05	$1/2^+$
		757.8 3	36 10	351.589	$3/2^+$

Adopted Levels, Gammas (continued)

$\gamma(^{101}\text{Mo})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	I_γ	E_f	J_f^π
1109.23	3/2 ⁺	790.0 5	34 10	315	7/2,9/2 ⁺
		814.9 2	21 5	294.586	1/2 ⁺
		1052.8 3	100 8	57.015	5/2 ⁺
1116.86	3/2,5/2	202.5 2	11 7	914.19	7/2 ⁺ ,9/2 ⁺
		406.80 [#] 6	50 [#] 20	709.98	(1/2 ⁺)
		765.9 2	100 28	351.589	3/2 ⁺
1199.41	1/2,3/2,5/2,7/2	631.79 10	20 2	567.55	5/2 ⁺
		719.67 7	100 11	479.78	3/2 ⁺
1229.84	3/2,5/2	218.2 4	24 10	1011.01	(1/2 ⁺)
		406.80 [#] 6	52 [#] 21	823.09	1/2 ⁺ ,3/2 ⁺ ,5/2 ⁺
		603.69 15	39 7	626.36	7/2,9/2 ⁺
		940.4 5	100 10	289.531	3/2 ⁺
		1229.70 10	46 6	0.0	1/2 ⁺
1281.22	3/2,5/2	164.0 2	20 9	1116.86	3/2,5/2
		234.1 2	77 18	1047.05	1/2 ⁺
		367.5 2	48 27	914.19	7/2 ⁺ ,9/2 ⁺
		697.7 2	68 45	583.39	7/2 ⁺ ,9/2 ⁺
		962.4 2	100 9	318.858	(5/2 ⁺)
1291.25	3/2 ⁻	181.5 2	10.0 16	1109.23	3/2 ⁺
		436.7 5	8 4	854.07	1/2 ⁺ ,3/2 ⁺ ,5/2 ⁺
		722.44 6	33 8	568.85	1/2 ⁺
		972.6 3	100 6	318.858	(5/2 ⁺)
		1119.9 3	38 6	170.958	5/2 ⁺
1318	19/2 ⁻	616 2	100	702.0	15/2 ⁻
1349.71	(1/2,3/2)	1030.85 10	100	318.858	(5/2 ⁺)
1447.28	3/2,5/2	165.90 25	5 4	1281.22	3/2,5/2
		392.9 4	19 10	1054.34	1/2,3/2,5/2
		616.78 14	12.7 22	830.43	7/2 ⁺ ,9/2 ⁺
		636.7 2	11.9 22	810.60	(1/2 ⁻ ,3/2 ⁻)
		967.9 3	100 11	479.78	3/2 ⁺
		1127.8 2	11 4	318.858	(5/2 ⁺)
		1153.0 3	52 6	294.586	1/2 ⁺
		1157.5 3	58 6	289.531	3/2 ⁺
		1447.7 4	29 5	0.0	1/2 ⁺
2090	23/2 ⁻	772 2	100	1318	19/2 ⁻
2981	27/2 ⁻	891 2	100	2090	23/2 ⁻
3962	31/2 ⁻	981 2	100	2981	27/2 ⁻
5031	35/2 ⁻	1069 2	100	3962	31/2 ⁻

[†] From ¹⁰¹Mo(n, γ).

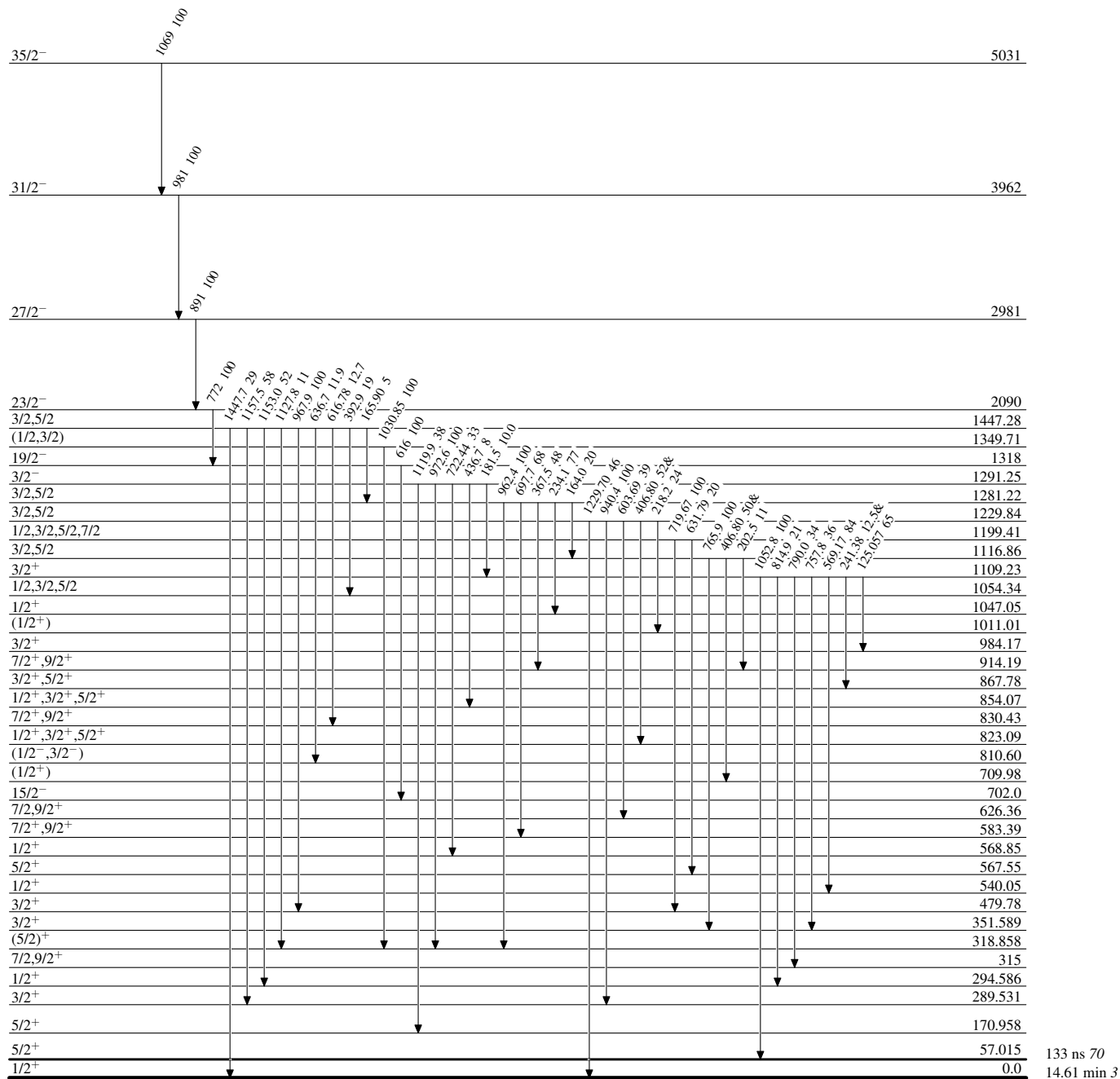
Adopted Levels, Gammas (continued)

$\gamma(^{101}\text{Mo})$ (continued)

- ‡ 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.
Multiply placed with undivided intensity.
@ Multiply placed with intensity suitably divided.

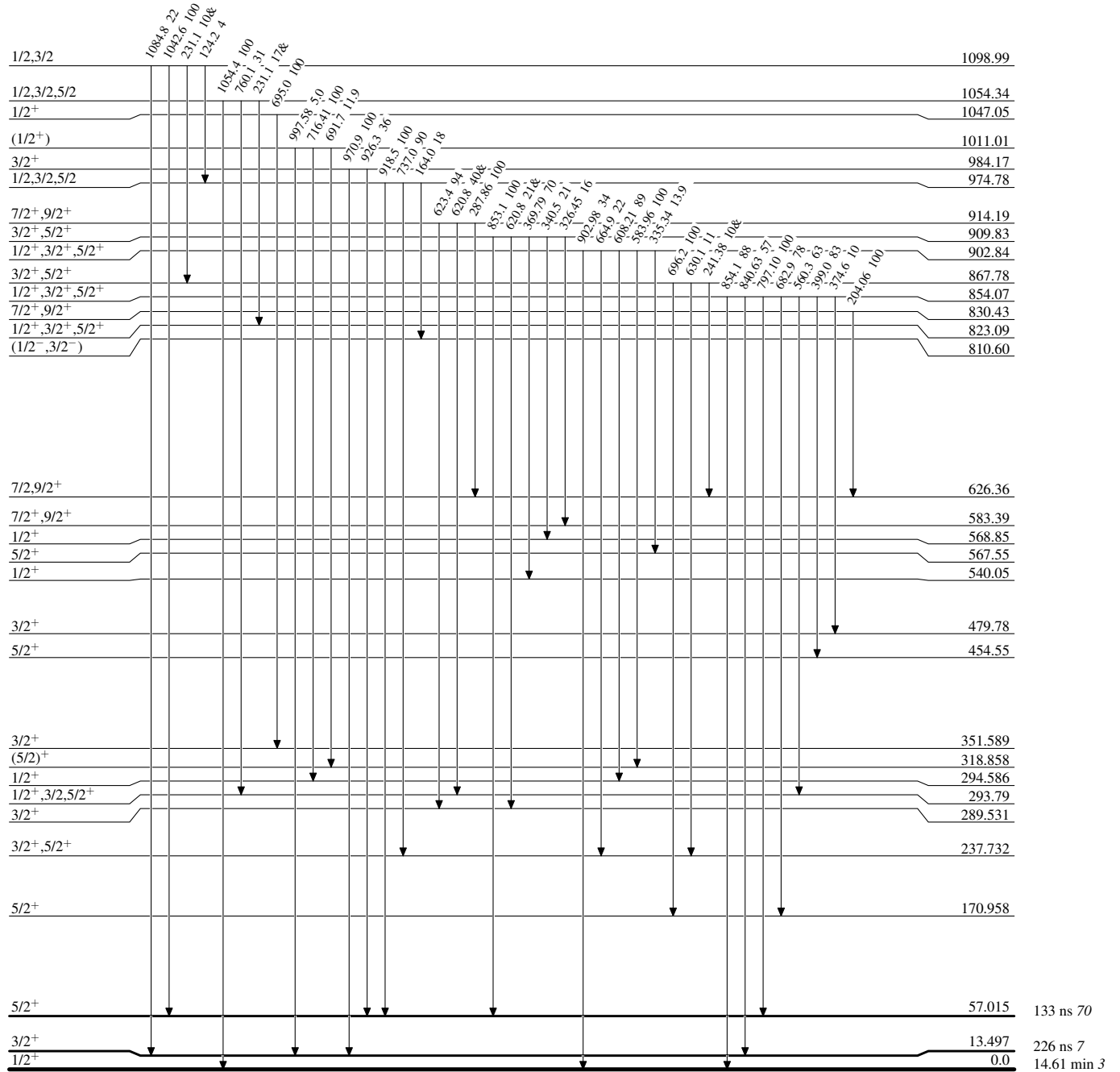
Adopted Levels, GammasLevel Scheme

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

 $^{101}_{42}\text{Mo}_{59}$

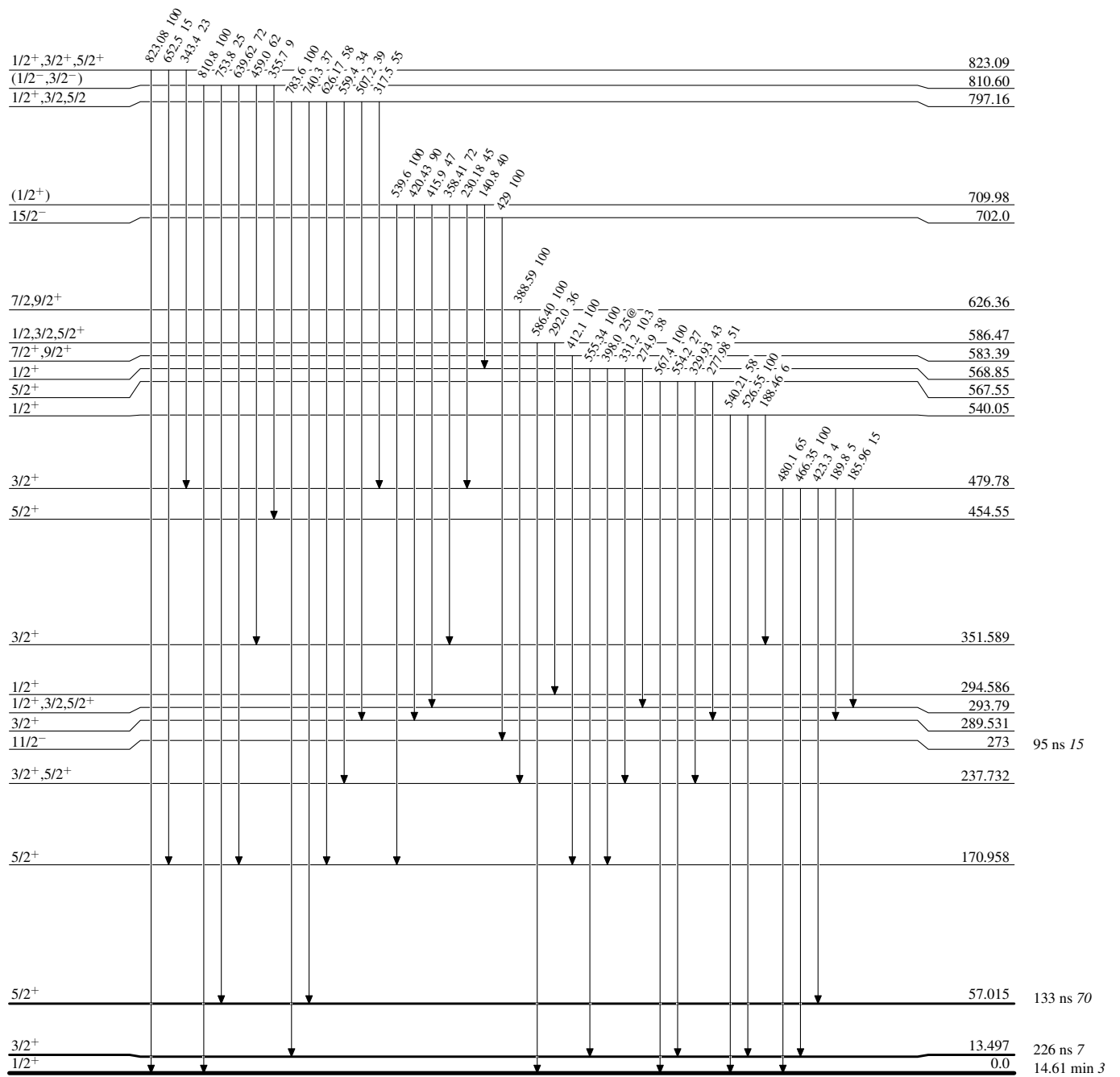
Adopted Levels, Gammas**Level Scheme (continued)**

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

 $^{101}_{42}\text{Mo}_{59}$

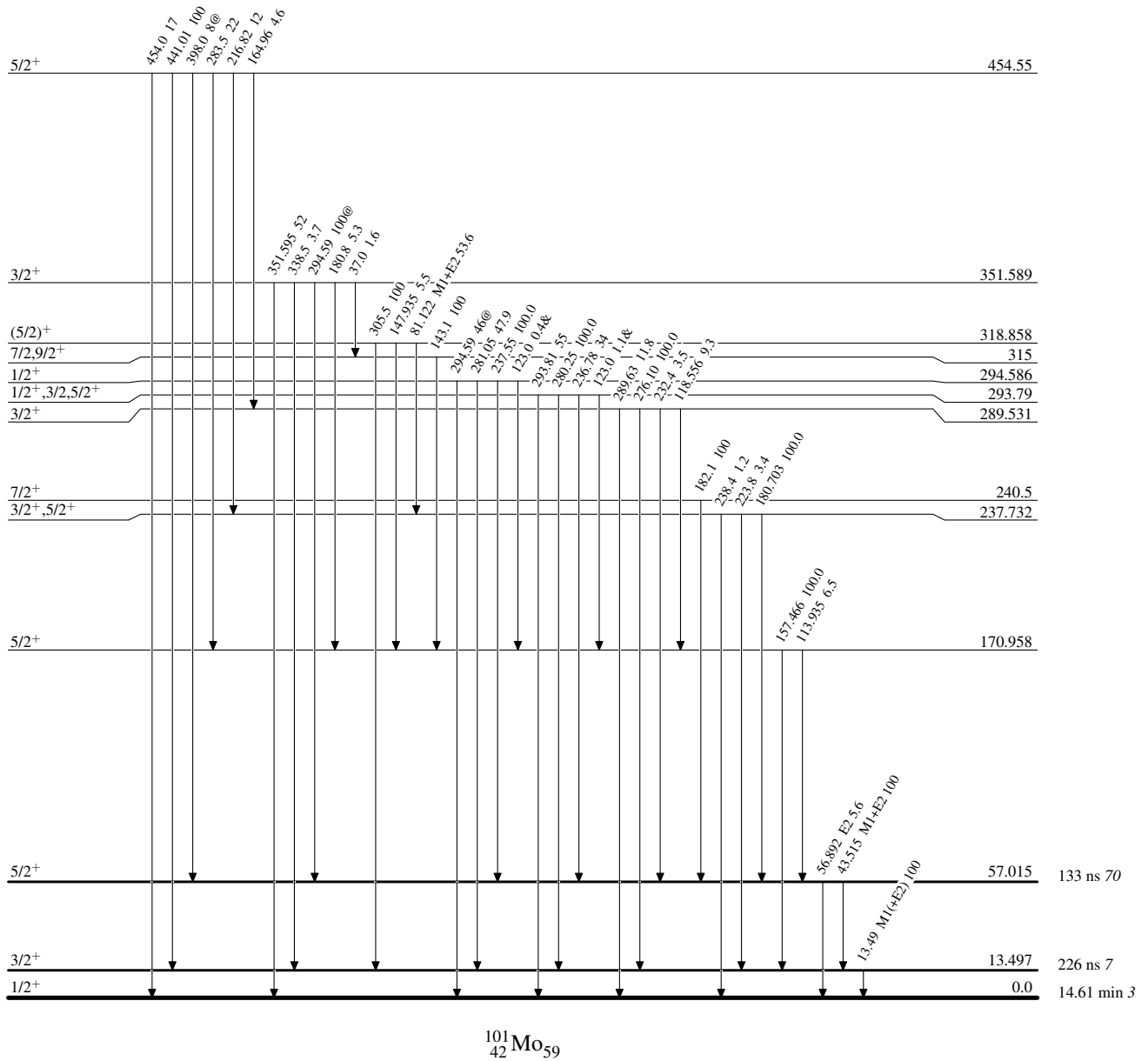
Adopted Levels, Gammas**Level Scheme (continued)**

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

 $^{101}_{42}\text{Mo}_{59}$

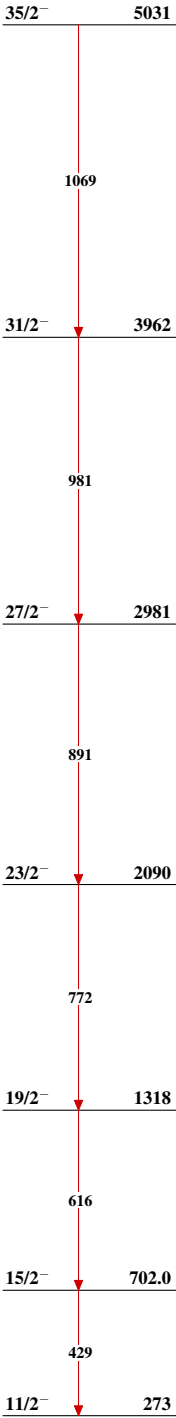
Adopted Levels, Gammas**Level Scheme (continued)**

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



Adopted Levels, Gammas

Band(A): Decoupled
neutron h11/2 band



¹⁰¹₄₂Mo₅₉