

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne	NDS 110,1745 (2009)	31-Dec-2008

$Q(\beta^-) = -5.76 \times 10^3$ 10; $S(n) = 1.02 \times 10^4$ syst; $S(p) = 2146$ 5; $Q(\alpha) = -5. \times 10^1$ 4 [2012Wa38](#)

Note: Current evaluation has used the following Q record $-5.78\text{E}3$ 7010167 SY2.25E3 19-7.4E1 13 [2003Au03](#).

Mass excess: -70694 12 ([2007Ma92](#)).

$S(p) = 2134$ 6 ([2007Ma92](#)).

 ^{102}In Levels

For different band interpretation, see [2002Li04](#).

Cross Reference (XREF) Flags

A ^{102}Sn ε decay
B $^{50}\text{Cr}(^{58}\text{Ni}, \alpha p n \gamma)$
C $^{54}\text{Fe}(^{58}\text{Ni}, 2\alpha n p \gamma)$

E(level) [†]	J^π [‡]	$T_{1/2}$	XREF	Comments
0.0 ^b	(6 ⁺)	23.3 s 1	ABC	$\% \varepsilon + \% \beta^+ = 100$; $\% \beta^+ p = 9.3 \times 10^{-03}$ 13 (1995Sz01) $T_{1/2}$: From delayed gammas (2003Gi06). $T_{1/2}$: Others: 22 s 1 (1995Sz01), 24 s 3 (1981Be16), 21 s 7 (1981CeZX). J^π : based on $J^\pi = 6^+$ for ^{104}In (1995Se08). J^π : 5^+ is less probable as the best fit for the tas spectrum in ^{102}Sn ε decay is obtained with 94 keV γ being E2 and 69 keV γ being M1.
94	(4 ⁺)		A	
144.94 ^b 18	(7 ⁺)		BC	
163	(3 ⁺)		A	J^π : 2^+ is less probable.
352.01 23	(7 ⁺)		B	
483	(2 ⁺)		A	
700	(3 ⁺)		A	
938	(2 ⁺)		A	
979.67 ^b 23	(8 ⁺)		BC	
1270	(1 ⁺) [#]		A	
1281.65 [@] 22	(9 ⁺)		BC	
1315.3 8	(9 ⁺)		B	
1500.0 4	(9 ⁺)		B	
1521	1 ⁺ [#]		A	
1546	1 ⁺ [#]		A	
1663.3 ^a 4	(10 ⁺)		BC	
1723.1 [@] 3	(10 ⁺)		BC	
1808?	(1 ⁺) [#]		A	
1908	1 ⁺ [#]		A	
1913.0 [@] 4	(11 ⁺)		BC	
2039.0 ^a 4	(11 ⁺)		BC	
2200?	(1 ⁺) [#]		A	
2702.0? 11	(10,12)		B	E(level): from 2002Jo05 .
3063.1 4	(12 ⁺)		BC	J^π : (10 ⁺ , 12 ⁺) (2002Jo05).
3179.7 ^a 4	(12 ⁺)		BC	J^π : (10 ⁺ , 12 ⁺) (2002Jo05).
3679.0 15			B	E(level): from 2002Jo05 .
3857.7 4	(13 ⁺)		B	

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Adopted Levels, Gammas (continued) ^{102}In Levels (continued)

E(level) [†]	J^π [‡]	XREF	Comments
3940.8 [@] 4	(12 ⁻)	BC	
4046.0 5	(12 ⁻)	B	
4118.9 ^a 4	(13 ⁻)	BC	J^π : (11 ⁺) (2002Jo05).
4212.4 5	(13 ⁻)	B	
4237.6 5	(12 ⁻)	B	
4313.7 5	(12 ⁻)	B	
4341.0 ^a 4	(14 ⁻)	B	J^π : (12 ⁺) (2002Jo05).
4479.1 4	(13 ⁻)	B	
4732.8 ^{&} 4	(13 ⁺)	BC	
4814.0 5	(14 ⁻)	B	
4893.9 5	(14 ⁻)	B	
4928.3 5	(13 ⁺)	B	
4957.3 ^a 5	(15 ⁻)	BC	
5189.3 [@] 10		BC	E(level): Only observed in $^{54}\text{Fe}(^{58}\text{Ni}, 2\alpha n p \gamma)$ (2002So12).
5191.7 ^{&} 4	(14 ⁺)	C	
5852.7 ^{&} 4	(15 ⁺)	BC	
5978.0 [@] 15		C	E(level): Only observed in $^{54}\text{Fe}(^{58}\text{Ni}, 2\alpha n p \gamma)$ (2002So12).
6236.2 [@] 4	(16 ⁺)	B	
6483.3 ^{&} 5	(16 ⁻)	B	
6627.4 [@] 5	(17 ⁺)	B	
7415.4 6		B	
7459.3 ^{&} 5	(17 ⁻)	B	
8175.0 6		B	
8247.7 ^{&} 6		B	
9058.6 ^{&} 7		B	

[†] From a least-squares fit to adopted gammas.

[‡] Based on $\gamma\gamma(\theta)$, $\gamma(\text{lin pol})$, band structure in (HI,xn γ), systematics and shell-model calculations, unless noted otherwise.

$J^\pi=1^+$ from very low logft values (≤ 4.6) in ^{102}Sn ε decay.

@ Band(A): γ cascade based on (9⁺) (2002So12).

& Band(B): γ cascade based on (13⁺) (2002So12).

^a Band(C): γ cascade based on (10⁺) (2002So12).

^b Band(D): γ cascade based on (6⁺) (2002So12).

 $\gamma(^{102}\text{In})$

$E_i(\text{level})$	J_i^π	E_γ [†]	I_γ [†]	E_f	J_f^π	Mult. [‡]	Comments
94	(4 ⁺)	94	100	0.0	(6 ⁺)	(E2)	Mult.: From best fit for the tas spectrum in ^{102}Sn ε decay obtained with 94 keV γ being E2 and 69 keV γ being M1.
144.94	(7 ⁺)	144.9 2	100	0.0	(6 ⁺)	M1	
163	(3 ⁺)	69	100	94	(4 ⁺)	(M1)	Mult.: From best fit for the tas spectrum in ^{102}Sn ε decay obtained with 94 keV γ being E2 and 69 keV γ being M1.
352.01	(7 ⁺)	352.1 3	100	0.0	(6 ⁺)		
483	(2 ⁺)	320	100	163	(3 ⁺)		
700	(3 ⁺)	538	100	163	(3 ⁺)		
938	(2 ⁺)	238	83 33	700	(3 ⁺)		
		844	100 33	94	(4 ⁺)		
979.67	(8 ⁺)	628.0 3	10.3 7	352.01	(7 ⁺)		
		834.8 3	100 7	144.94	(7 ⁺)	M1	

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Adopted Levels, Gammas (continued)

$\gamma(^{102}\text{In})$ (continued)							
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult. [‡]	Comments
1270	(1 ⁺)	1107	100	163	(3 ⁺)		
1281.65	(9 ⁺)	302.14 18	31.2 16	979.67	(8 ⁺)	M1	
		929.4 3	11.5 3	352.01	(7 ⁺)		
		1136.64 18	100 3	144.94	(7 ⁺)	E2	
1315.3	(9 ⁺)	336	100	979.67	(8 ⁺)		
1500.0	(9 ⁺)	520.3 3	100	979.67	(8 ⁺)		
1521	1 ⁺	583	100	938	(2 ⁺)		
1546	1 ⁺	1063	100	483	(2 ⁺)		
1663.3	(10 ⁺)	163.2 3	2.8 4	1500.0	(9 ⁺)		
		381.9 5	100 2	1281.65	(9 ⁺)	M1	
1723.1	(10 ⁺)	223.0 5	1.2 5	1500.0	(9 ⁺)		
		441.4 3	100 2	1281.65	(9 ⁺)	M1	
1808?	(1 ⁺)	1325 [#]		483	(2 ⁺)		
1908	1 ⁺	1425	100	483	(2 ⁺)		
1913.0	(11 ⁺)	189.92 18	100 3	1723.1	(10 ⁺)	M1	
		249.62 18	78 3	1663.3	(10 ⁺)	D	
2039.0	(11 ⁺)	315.80 24	39.1 12	1723.1	(10 ⁺)	M1	
		375.78 18	100 3	1663.3	(10 ⁺)	M1	
		724		1315.3	(9 ⁺)		
2200?	(1 ⁺)	1500 [#]		700	(3 ⁺)		
		1717 [#]		483	(2 ⁺)		
2702.0?	(10,12)	789	100	1913.0	(11 ⁺)		
3063.1	(12 ⁺)	1024.1 3	100 6	2039.0	(11 ⁺)	M1	
		1150.2 3	67.8 23	1913.0	(11 ⁺)	(M1)	
3179.7	(12 ⁺)	1140.8 4	87 10	2039.0	(11 ⁺)	D	
		1266.9 3	100 10	1913.0	(11 ⁺)	M1	
3679.0		977	100	2702.0?	(10,12)		
3857.7	(13 ⁺)	678.0 3	100 7	3179.7	(12 ⁺)	D	
		794.6 4	93 7	3063.1	(12 ⁺)	D	
		1818.4 3	25 7	2039.0	(11 ⁺)		
3940.8	(12 ⁻)	2027.9 3	100	1913.0	(11 ⁺)	D	
4046.0	(12 ⁻)	2007.0 5	100	2039.0	(11 ⁺)	D	
4118.9	(13 ⁻)	178.3 3	32.2 23	3940.8	(12 ⁻)		
		939.2 3	100 6	3179.7	(12 ⁺)	D	
		1055.6 3	89 6	3063.1	(12 ⁺)	D	
4212.4	(13 ⁻)	271.6 4	100	3940.8	(12 ⁻)	M1	
4237.6	(12 ⁻)	2324.4 4	100	1913.0	(11 ⁺)	D	
4313.7	(12 ⁻)	2400.4 5	100	1913.0	(11 ⁺)		
4341.0	(14 ⁻)	222.08 17	100 4	4118.9	(13 ⁻)	M1	
		2302		2039.0	(11 ⁺)		
4479.1	(13 ⁻)	165.2 4	19 8	4313.7	(12 ⁻)		
		241.5 3	100 8	4237.6	(12 ⁻)		
		433.1 3	54 8	4046.0	(12 ⁻)		
		1416.3 4	88 19	3063.1	(12 ⁺)		
4732.8	(13 ⁺)	390.6 10	52 6	4341.0	(14 ⁻)	M1	If J^π of 4341 level is 14 ⁻ and that of 4732 level 13 ⁺ then M1 from 4732 level impossible.
		1553.1 5	10.0 17	3179.7	(12 ⁺)	D	
		1669.8 3	17.5 17	3063.1	(12 ⁺)		
		2819.7 3	100 6	1913.0	(11 ⁺)	Q	
4814.0	(14 ⁻)	334.8 3	100 3	4479.1	(13 ⁻)	D	
		601.5 4	21 3	4212.4	(13 ⁻)		
4893.9	(14 ⁻)	681.5 4	100	4212.4	(13 ⁻)		
4928.3	(13 ⁺)	2889.8 6	100 17	2039.0	(11 ⁺)		
		3015.0 6	100 17	1913.0	(11 ⁺)		
4957.3	(15 ⁻)	616.7 4	100	4341.0	(14 ⁻)	D	

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Adopted Levels, Gammas (continued) $\gamma(^{102}\text{In})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult. [‡]	Comments
5189.3		976.9 9	100	4212.4	(13 ⁻)		
5191.7	(14 ⁺)	458.90 19	100 4	4732.8	(13 ⁺)	(M1)	
		1333.8 4	21 4	3857.7	(13 ⁺)		
5852.7	(15 ⁺)	661.09 20	100 5	5191.7	(14 ⁺)		
		924.5 4	13 2	4928.3	(13 ⁺)		
		1120.0 4	21 2	4732.8	(13 ⁺)		
5978.0		788.7 10	100	5189.3		D	E_γ : Only observed in $^{54}\text{Fe}(^{58}\text{Ni}, 2\alpha n p \gamma)$ (2002So12).
6236.2	(16 ⁺)	383.7 2	100 4	5852.7	(15 ⁺)	D	
		1044.1 3	23.3 17	5189.3			
		1279.0 3	11.7 17	4957.3	(15 ⁻)	D	$A_2 = -0.8$ 4.
6483.3	(16 ⁻)	1526.0 4	39 3	4957.3	(15 ⁻)		
		1589.4 3	12 3	4893.9	(14 ⁻)		
		1669.2 3	100 3	4814.0	(14 ⁻)		
		2142		4341.0	(14 ⁻)		E_γ : from level-scheme of 2002Li04, not given in gamma energy table.
6627.4	(17 ⁺)	391.2 3	100	6236.2	(16 ⁺)	D	
7415.4		2458.1 4	100	4957.3	(15 ⁻)		
7459.3	(17 ⁻)	975.9 2	100 4	6483.3	(16 ⁻)		
		2502.5 6	9.7 17	4957.3	(15 ⁻)		
8175.0		715.7 3	100	7459.3	(17 ⁻)		
8247.7		788.4 3	100	7459.3	(17 ⁻)		
9058.6		810.9 3	100	8247.7			

[†] Either from (HI,xn γ) or ^{102}Sn ε decay.

[‡] From $\gamma\gamma(\theta)$, $\gamma(\text{lin pol})$ in $^{54}\text{Fe}(^{58}\text{Ni}, 2\alpha n p \gamma)$ (2002So12).

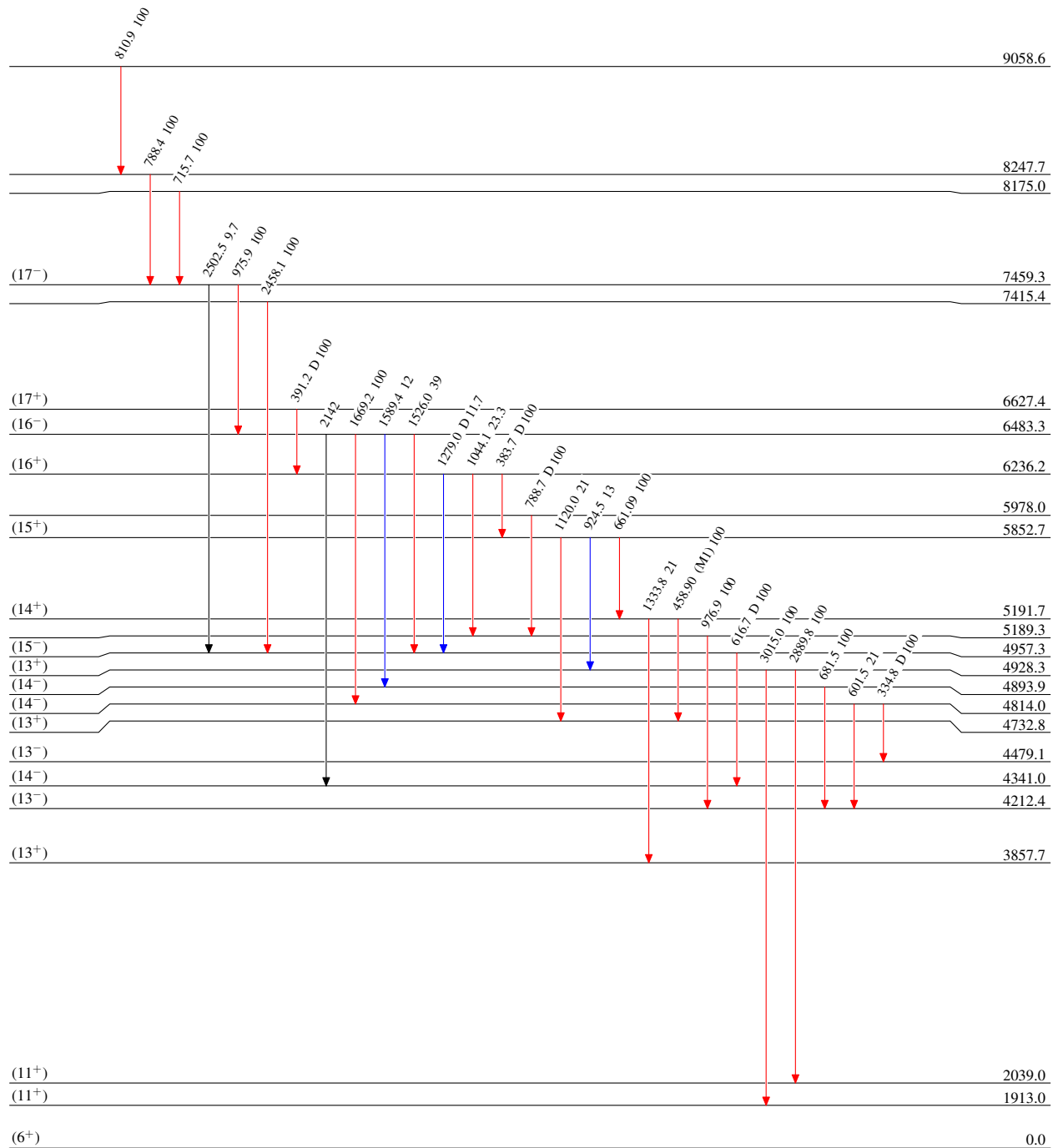
Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas**Level Scheme**

Intensities: Type not specified

Legend

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



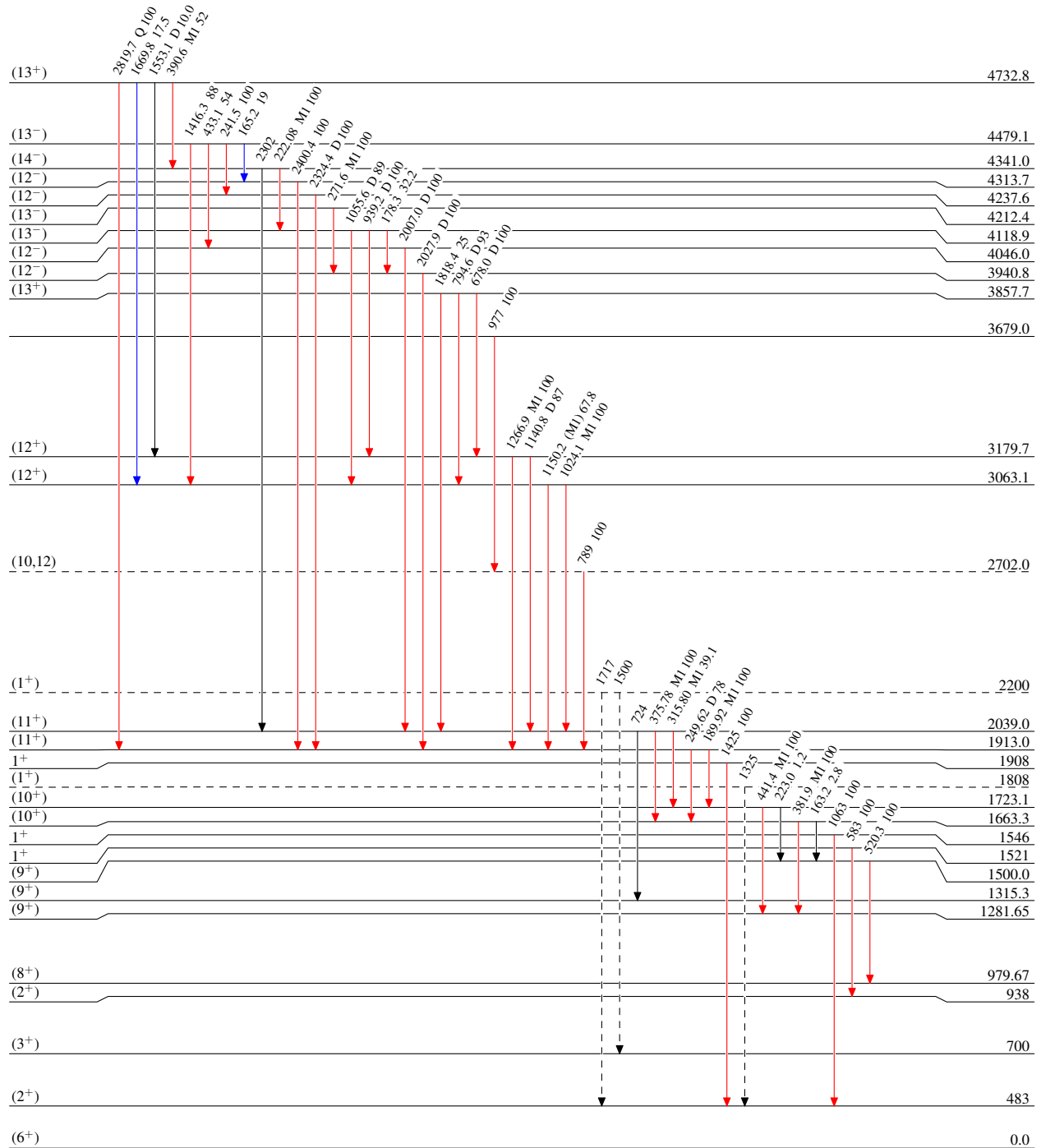
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Type not specified

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



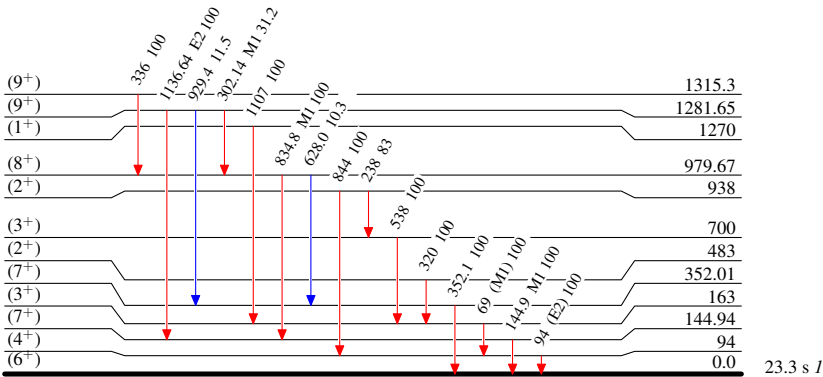
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

Legend

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



$^{102}_{49}\text{In}_{53}$

Adopted Levels, Gammas