^{152}Sm(n,γ) E=th

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 170, 1 (2020)	16-Aug-2020

The level scheme is primarily from 1969Sm04 with the addition of a few levels deduced from primary γ's reported by 1969Re04, 1971Be41, and 1982Ba15 and levels proposed by 1997GoZN from $\gamma\gamma$ coincidence results. Average-resonance capture measurements with 2-keV neutrons have been reported by 1997GoZN are given in another data set.

1961Sc19: curved-crystal spectrometer measurement of E_γ and I_γ for 7 lines.

1966Ne06: curved-crystal spectrometer measurement of E_γ and I_γ for 4 lines.

1969Re04: Ge detector measurement of E_γ and I_γ for 31 lines from 223 to 5867 keV.

1969Sm04: curved-crystal spectrometer measurements of E_γ and I_γ up to 1050 keV, Ge detector measurements above 4500 keV, and magnetic spectrometer measurements of conversion electrons for γ rays up to 660 keV.

1971Be41: Si(Li) and Ge detector measurements of E_γ and I_γ for 79 lines below 1220 keV and 25 above 4460 keV.

1981BaZF: a summary; see 1982Ba15.

1982Ba15: report E_γ and I_γ for 15 lines above 3200 keV and assign 4 new levels.

1997GoZN: report of a reanalysis some earlier data and $\gamma\gamma$ coincidence data,

1998Go10: comments on the levels at 404 and 405 keV.

1982Ba15 appear to have assigned some E_γ values as both primary γ's and ground-state feeding secondary transitions. The evaluator has used only the values in their table and used them only as primary γ's.

Other measurements: 1960Dr04, 1969Re04, 1972De67, 1972Kr20.

^{153}Sm Levels

E(level)†	J^π‡	Comments
0.0	3/2$^+$	
7.536 *4*	5/2$^+$	E(level): Calculated from γ-ray energy differences. The existence of the 7.53-keV transition was inferred by 1969Sm04. The small value of the energy spacing in the ground-state band results from the expected strong Coriolis coupling between the ground-state band and higher lying positive-parity orbitals, principally 5/2[642] and 1/2[660], arising from the $i_{13/2}$ spherical shell-model state (1971Bu16).
35.844 *4*	3/2$^-$	
53.534 *4*	7/2$^+$	
65.469 *7*	9/2$^+$	
90.875 *3*	5/2$^-$	
112.955? *8*		
126.412# *9*	(1/2$^-$)	
127.298 *3*	3/2$^-$	
174.173 *5*	(7/2$^-$)	
182.902 *4*	5/2$^-$	
194.656 *14*	(5/2)	
262.331 *6*	(7/2)$^+$	
265.927 *11*	(7/2$^-$)	
276.713 *5*	(3/2)$^+$	
321.113 *7*	3/2$^+$	
356.686 *7*	(5/2)$^+$	
362.286 *10*	(5/2$^+$)	
404.130# *14*	1/2$^-$	
405.470 *14*	3/2$^-$	
414.925 *13*	1/2$^+$	
418.01# *8*	1/2$^+$	
447.05 *3*	(7/2$^+$)	
450.051 *11*	(5/2)$^-$	
481.088 *12*	(3/2)$^+$	
524.360 *17*	(5/2$^+$)	
584.31? *4*		

Continued on next page (footnotes at end of table)

^{152}Sm(n,γ) E=th (continued)

^{153}Sm Levels (continued)

E(level)†	J$^{\pi}$‡	Comments
630.20 *5*	1/2$^-$,3/2$^-$	
647.9? *10*		
695.80 *4*	(1/2)$^-$	
734.873 *23*	1/2$^+$,3/2$^+$	
750.32 *5*	(3/2)$^-$	
788.92# *5*	3/2$^+$	
916.8 *7*	1/2$^+$,3/2$^+$	
984.2# *4*	3/2$^+$	
984.3 *8*	1/2$^-$,3/2$^-$	
1004.3 *10*		E(level): Primary γ defining this level is a doublet.
1018.3 *10*		E(level): Primary γ defining this level is a doublet.
1106.74# *23*	3/2$^+$	
1110.4 *7*	1/2$^+$,3/2$^+$	
1171.1 *7*	1/2$^-$,3/2$^-$	
1223.7 *10*	1/2$^+$,3/2$^+$	
1322.6 *5*	1/2$^-$,3/2$^-$	
1344.0 *6*	1/2$^+$,3/2$^+$	
1362.7 *5*	1/2$^-$,3/2$^-$	
1393.9? *8*		
1400.0? *8*		
1526.9? *15*	1/2$^-$,3/2$^-$	
1557.7? *15*	1/2$^+$,3/2$^+$	
1924.9 *8*		
1933.8 *7*		
2496.6 *12*		
2642.8 *7*		
(5868.41 *12*)	1/2$^+$	E(level): from the least-squares fit on γ ray energies. Additional information 1. J$^{\pi}$: From s-wave capture in J$^{\pi}$=0$^+$ state.

† From least-squares fit to γ energies.

‡ From 1969Sm04 for most single values and from average-resonance capture by 1997GoZN where two values are given.

from 1997GoZN.

γ(^{153}Sm)

α(exp) values in comments are from 1969Sm04.

E_γ[†]	I_γ[‡#m]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	δ	α[n]	Comments
7.535		7.536	5/2+	0.0	3/2+	M1			ce(L2)+ce(L3)=50 *20* and ce(M)<10 per 100 captures. E_γ: From level energy.
28.309 *5*	2.10 *21*	35.844	3/2−	7.536	5/2+	E1			α(L1)exp, α(L2)exp, α(L3)exp: <1.
35.571 *5*	0.030 *3*	356.686	(5/2)+	321.113	3/2+				
35.842 *5*	6.2 *6*	35.844	3/2−	0.0	3/2+	E1			E_γ: Other: 35.847 *2* (1961Sc19). α(L1)exp=0.30 *10*, α(L2)exp<0.16, α(L3)exp<0.20.
36.423 *5*	0.021 *4*	127.298	3/2−	90.875	5/2−	M1			α(L1)exp, α(L2)exp, α(L3)exp: <48. Mult.: α allows E1 or M1, but J^π's require M1.
37.343 *5*	0.223 *22*	90.875	5/2−	53.534	7/2+	E1			α(L1)exp, α(L2)exp, α(L3)exp: <4.4. Mult.: α allows E1 or M1, but J^π's require E1.
45.996 *5*	0.26 *3*	53.534	7/2+	7.536	5/2+	M1+E2	1.0 *+10−5*	24 *14*	α(L1)exp=5.7 *37*, α(L2)exp=6.1 *40*, α(L3)exp=9.6 *43*.
[x]51.040[&] *10*	0.030 *6*								
53.534 *5*	0.136 *14*	53.534	7/2+	0.0	3/2+	E2			α(L1)exp=2.6 *17*, α(L2)exp=9.2 *23*, α(L3)exp=10.3 *26*. δ: δ(E2/M1) > 1.7.
55.031 *8*	0.171 *17*	90.875	5/2−	35.844	3/2−	(M1+E2)	<0.6		α(K)exp<10; α(L1)exp, α(L2)exp, α(L3)exp: <1.7.
55.61 *1*	0.029 *6*	182.902	5/2−	127.298	3/2−				α(K)exp<60; α(L1)exp, α(L2)exp, α(L3)exp: <10.
57.94 *1*	0.042 *9*	65.469	9/2+	7.536	5/2+	[j]			3<α(K)exp<36; 1.5< (α(L1)exp, α(L2)exp, α(L3)exp)) <11.
59.42 *1*	0.026 *5*	112.955?		53.534	7/2+				α(K)exp<60; α(L1)exp, α(L2)exp, α(L3)exp: <11.
[x]63.66[&] *1*	0.007 *4*								
66.16[&] *1*	0.008 *2*	481.088	(3/2)+	414.925	1/2+				
76.96[g] *1*	0.043 *9*	481.088	(3/2)+	404.130	1/2−				
79.43 *1*	0.021 *5*	262.331	(7/2)+	182.902	5/2−				
83.03 *2*	0.043 *8*	265.927	(7/2−)	182.902	5/2−				
83.302 *8*	0.059 *12*	174.173	(7/2−)	90.875	5/2−				
83.339 *5*	1.70 *10*	90.875	5/2−	7.536	5/2+	E1			α(K)exp=41 *13*; α(L1)exp=0.076 *46*.
88.16 *1*	0.0073 *22*	262.331	(7/2)+	174.173	(7/2−)				
90.56[g] *1*	0.052 *10*	126.412	(1/2−)	35.844	3/2−				
90.766[&] *13*	0.116 *23*	356.686	(5/2)+	265.927	(7/2−)				
90.874 *5*	2.47 *12*	90.875	5/2−	0.0	3/2+	E1			E_γ: Other: 90.875 *3* (1961Sc19). α(K)exp=0.54 *22*.
91.455 *5*	0.80 *4*	127.298	3/2−	35.844	3/2−	M1(+E2+E0)			α(K)exp=3.08 *12*, α(L1)exp=0.38 *19*.
92.03 *1*	0.08 *1*	182.902	5/2−	90.875	5/2−				α(K)exp=5.0; α(L1)exp, α(L2)exp, α(L3)exp: <1.2.
93.81 *1*	0.008 *2*	276.713	(3/2)+	182.902	5/2−				
[x]104.58[&] *1*	0.0080 *24*								
[x]104.93[&] *1*	0.007 *3*								
105.42 *1*	0.016 *3*	112.955?		7.536	5/2+				α(K)exp<12.5; α(L1)exp, α(L2)exp, α(L3)exp: <6.3.
108.71 *1*	0.250 *15*	174.173	(7/2−)	65.469	9/2+				α(K)exp<1.2; α(L1)exp, α(L2)exp, α(L3)exp: <0.4.

$^{153}_{62}Sm_{91}$-3

^{152}Sm(n,γ) E=th (continued)

γ(^{153}Sm) (continued)

E_γ[†]	I_γ[‡#m]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	Comments
[x]108.89 *1*	0.051 *5*						
[x]112.65[&] *1*	0.018 *3*						
[x]113.18[&] *1*	0.0100 *15*						
[x]117.330[&] *5*	0.014 *2*						
[x]118.838[a] *5*	0.120 *8*						
119.763 *5*	2.84 *14*	127.298	3/2⁻	7.536	5/2⁺	E1	E_γ: Other: 119.770 *3* (1961Sc19). α(K)exp=0.150 *18*, α(L1)exp=0.027 *5*.
120.64 *1*	0.130 *9*	174.173	(7/2⁻)	53.534	7/2⁺		α(K)exp<0.15, α(L1)exp<0.023.
[x]123.62 *2*	0.029 *4*						
126.44[o] *2*	0.012[o] *4*	126.412	(1/2⁻)	0.0	3/2⁺		
126.44[o] *2*	0.012[o] *4*	321.113	3/2⁺	194.656	(5/2)		
127.298 *5*	6.6 *3*	127.298	3/2⁻	0.0	3/2⁺	E1	E_γ: Other: 127.300 *3* (1961Sc19). α(K)exp=0.140 *14*, α(L1)exp=0.017 *4*.
129.36 *1*	0.69 *3*	182.902	5/2⁻	53.534	7/2⁺	E1	α(K)exp<0.18.
[x]135.54 *2*	0.028 *4*						
138.21[o] *2*	0.024[o] *3*	321.113	3/2⁺	182.902	5/2⁻		
138.21[o] *2*	0.024[o] *3*	414.925	1/2⁺	276.713	(3/2)⁺		
138.32 *2*	0.035 *5*	174.173	(7/2⁻)	35.844	3/2⁻		α(K)exp<2.9.
138.64 *3*	0.015 *2*	265.927	(7/2⁻)	127.298	3/2⁻		
[x]146.73 *4*	0.016 *3*						
147.06 *1*	0.242 *24*	182.902	5/2⁻	35.844	3/2⁻	M1,E2	α(K)exp=0.62 *22*.
149.417 *11*	0.025 *3*	276.713	(3/2)⁺	127.298	3/2⁻		
162.09 *2*	0.027 *5*	524.360	(5/2⁺)	362.286	(5/2⁺)		
[x]163.21 *2*	0.011 *4*						
166.64 *1*	0.78 *4*	174.173	(7/2⁻)	7.536	5/2⁺	E1	E_γ: Other: 166.646 *8* (1961Sc19). α(K)exp=0.083 *18*.
[x]167.15[a] *3*	0.008 *3*						
170.33 *3*	0.013 *4*	447.05	(7/2⁺)	276.713	(3/2)⁺		
171.45 *1*	0.069 *7*	262.331	(7/2)⁺	90.875	5/2⁻		
173.34 *1*	0.137 *11*	450.051	(5/2)⁻	276.713	(3/2)⁺	E1	
[x]173.70 *1*	0.014 *4*						
175.370 *11*	1.21 *7*	182.902	5/2⁻	7.536	5/2⁺	E1	E_γ: Other: 175.365 *8* (1961Sc19). α(K)exp=0.060 *7*.
[x]180.34 *3*	0.0110 *22*						
[x]181.80 *3*	0.0110 *22*						
[x]182.44 *2*	0.0100 *25*						
182.52 *1*	0.024 *4*	356.686	(5/2)⁺	174.173	(7/2⁻)		
182.900 *8*	1.49 *7*	182.902	5/2⁻	0.0	3/2⁺	E1	E_γ: Other: 182.901 *8* (1961Sc19). α(K)exp=0.044 *8*.
[x]184.82 *2*	0.044 *9*						
185.845 *11*	0.056 *6*	276.713	(3/2)⁺	90.875	5/2⁻		
187.10 *2*	0.008 *2*	194.656	(5/2)	7.536	5/2⁺		

$^{153}_{62}Sm_{91}$-4

$^{152}Sm(n,\gamma)$ E=th (continued)

$\gamma(^{153}Sm)$ (continued)

E_γ[†]	I_γ[‡#m]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	Comments
188.119 *11*	0.028 *3*	362.286	(5/2$^+$)	174.173	(7/2$^-$)		
193.82 *2*	0.060 *9*	321.113	3/2$^+$	127.298	3/2$^-$		
[x]194.33 *2*	0.06 *1*						
194.66 *3*	0.021 *5*	194.656	(5/2)	0.0	3/2$^+$		
[x]194.95[&] *4*	0.014 *4*						
[x]195.58[&] *4*	0.018 *5*						
[x]195.80[&h] *4*	0.018 *5*						
196.866 *11*	0.21 *1*	262.331	(7/2)$^+$	65.469	9/2$^+$		α(K)exp<14. Mult.: ce data imply E1,E2 but ΔJ and $\Delta\pi$ require E2.
[x]198.20 *4*	0.009 *3*						
[x]200.93[&] *7*	0.033 *5*						
[x]202.78 *5*	0.0110 *22*						
203.25 *4*	0.042 *8*	524.360	(5/2$^+$)	321.113	3/2$^+$		
204.36 *3*	0.070 *6*	481.088	(3/2)$^+$	276.713	(3/2)$^+$		
208.802 *14*	0.103 *12*	262.331	(7/2)$^+$	53.534	7/2$^+$		
[x]211.24 *2*	0.020 *3*						
[x]212.14 *4*	0.020 *3*						
[x]212.844 *11*	0.150 *9*						
[x]220.77 *6*	0.0040 *12*						
[x]222.656 *11*	0.244 *20*						
223.173 *11*	0.250 *20*	276.713	(3/2)$^+$	53.534	7/2$^+$	(E2)[j]	α(K)exp=0.22 *8*, α(L1)exp=0.064 *38*.
229.40 *5*	0.0063 *19*	356.686	(5/2)$^+$	127.298	3/2$^-$		
230.243 *13*	0.015 *2*	321.113	3/2$^+$	90.875	5/2$^-$		
234.93[b] *5*	0.029 *3*	362.286	(5/2$^+$)	127.298	3/2$^-$		
240.868[&a] *14*	0.047 *7*	276.713	(3/2)$^+$	35.844	3/2$^-$		
[x]242.24 *20*	0.014 *7*						
[x]243.06[&] *4*	0.037 *6*						
[x]244.62 *4*	0.029 *4*						
[x]247.08 *3*	0.030 *5*						
[x]247.62 *6*	0.0070 *21*						
[x]248.39 *4*	0.0140 *21*						
[x]249.14 *4*	0.024 *4*						
[x]249.73 *4*	0.0150 *23*						
[x]252.010[&] *16*	0.046 *7*						
254.794 *15*	0.449 *22*	262.331	(7/2)$^+$	7.536	5/2$^+$	M1,E2	α(K)exp=0.093 *37*.
[x]257.68 *5*	0.027 *5*						
258.43[o] *5*	0.008[o] *4*	265.927	(7/2$^-$)	7.536	5/2$^+$		
258.43[o] *5*	0.008[o] *4*	524.360	(5/2$^+$)	265.927	(7/2$^-$)		
[x]261.15 *5*	0.0036 *18*						
[x]261.58 *3*	0.055 *7*						
[x]261.76 *4*	0.011 *3*						
262.31 *4*	0.0057 *17*	262.331	(7/2)$^+$	0.0	3/2$^+$		

$^{153}_{62}Sm_{91}$-5

γ(^{153}Sm) (continued)

E_γ[†]	I_γ[‡#m]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	Comments
^{x}262.86 *4*	0.014 *3*						
263.20 *4*	0.016 *3*	584.31?		321.113	$3/2^+$		
^{x}264.25 *5*	0.008 *3*						
^{x}265.10 *4*	0.063 *5*						
265.78 *4*	0.043 *5*	356.686	$(5/2)^+$	90.875	$5/2^-$		
267.56 *3*	0.014 *3*	321.113	$3/2^+$	53.534	$7/2^+$		
^{x}268.09 *3*	0.013 *3*						
269.17 *2*	0.79 *5*	276.713	$(3/2)^+$	7.536	$5/2^+$		α(K)exp=0.041 *20*, α(L1)exp=0.013 *9*.
271.40 *8*	0.012 *4*	362.286	$(5/2^+)$	90.875	$5/2^-$		
^{x}275.20 *4*	0.037 *6*						
276.71 *2*	1.62 *10*	276.713	$(3/2)^+$	0.0	$3/2^+$	M1(+E2+E0)	α(K)exp=0.115 *10*, α(L1)exp=0.014 *6*.
277.72[g] *4*	0.044 *4*	404.130	$1/2^-$	126.412	$(1/2^-)$		
278.17 *2*	0.195 *12*	405.470	$3/2^-$	127.298	$3/2^-$	M1,E2	α(K)exp=0.087 *44*.
^{x}282.55 *4*	0.049 *6*						
^{x}284.41[&] *5*	0.013 *4*						
285.23 *4*	0.020 *4*	321.113	$3/2^+$	35.844	$3/2^-$		
287.49 *6*	0.030 *5*	414.925	$1/2^+$	127.298	$3/2^-$		
290.71[g] *8*	0.015 *5*	418.01	$1/2^+$	127.298	$3/2^-$		
291.17 *5*	0.090 *9*	356.686	$(5/2)^+$	65.469	$9/2^+$		
^{x}293.54 *7*	0.031 *6*						
296.82 *5*	0.028 *4*	362.286	$(5/2^+)$	65.469	$9/2^+$		
298.20 *5*	0.038 *5*	481.088	$(3/2)^+$	182.902	$5/2^-$		
^{x}298.94 *3*	0.075 *6*						
^{x}302.95[a] *4*	0.105 *13*					[i]	α(K)exp=0.114 *40*.
303.16 *4*	0.105 *13*	356.686	$(5/2)^+$	53.534	$7/2^+$	[i]	
^{x}307.21 *4*	0.93 *23*						
308.71 *7*	0.100 *8*	362.286	$(5/2^+)$	53.534	$7/2^+$		
^{x}310.62 *7*	0.019 *4*						
^{x}312.85 *5*	0.017 *4*						
313.54 *3*	0.235 *14*	321.113	$3/2^+$	7.536	$5/2^+$		
314.60 *3*	0.099 *8*	405.470	$3/2^-$	90.875	$5/2^-$		
^{x}315.21 *5*	0.053 *5*						
^{x}317.80 *3*	0.135 *11*						
321.13 *3*	2.64 *16*	321.113	$3/2^+$	0.0	$3/2^+$	M1	α(K)exp=0.065 *6*.
326.45 *5*	0.031 *5*	362.286	$(5/2^+)$	35.844	$3/2^-$		
^{x}327.81[a] *8*	0.017 *5*						
329.39 *3*	0.186 *13*	734.873	$1/2^+,3/2^+$	405.470	$3/2^-$		
330.75[g] *3*	0.103 *10*	734.873	$1/2^+,3/2^+$	404.130	$1/2^-$		
^{x}340.95 *5*	0.071 *7*						
^{x}347.85 *6*	0.018 *5*						
349.16 *5*	0.117 *9*	356.686	$(5/2)^+$	7.536	$5/2^+$		
350.20 *5*	0.156 *11*	524.360	$(5/2^+)$	174.173	$(7/2^-)$		
^{x}351.19 *6*	0.051 *6*						

$^{153}_{62}Sm_{91}$-6

γ(^{153}Sm) (continued)

E_γ [†]	I_γ [‡#m]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [@]	Comments
354.76[&] 3	1.01 6	362.286	(5/2+)	7.536	5/2+	M1	α(K)exp=0.062 9.
356.62[a] 10	0.038 10	356.686	(5/2)+	0.0	3/2+		
[x]358.48 6	0.050 7						
359.12 10	0.032 5	450.051	(5/2)−	90.875	5/2−		
[x]360.21 10	0.036 6						
362.30 3	0.81 6	362.286	(5/2+)	0.0	3/2+	M1(+E2)	α(K)exp=0.051 21.
[x]365.13 7	0.034 7						
[x]367.03 7	0.034 7						
368.27[g] 10	0.092 8	404.130	1/2−	35.844	3/2−		
369.63 3	0.300 18	405.470	3/2−	35.844	3/2−		
[x]370.43 9	0.028 8						
[x]371.89 9	0.016 6						
[x]372.87 4	0.075 8						
374.69 4	0.048 7	695.80	(1/2)−	321.113	3/2+		
379.10[&a] 4	0.132 11	414.925	1/2+	35.844	3/2−		
384.79[g] 4	0.102 10	788.92	3/2+	404.130	1/2−		
[x]386.02 7	0.021 6						
[x]389.12 16	0.054 16						
390.24[&b] 4	0.67 4	481.088	(3/2)+	90.875	5/2−	(E1)	α(K)exp<0.015.
393.58[o] 8	0.109[o] 11	447.05	(7/2+)	53.534	7/2+		
393.58[o] 8	0.109[o] 11	750.32	(3/2)−	356.686	(5/2)+		
396.49 4	0.43 3	450.051	(5/2)−	53.534	7/2+		
397.90 4	3.31 20	405.470	3/2−	7.536	5/2+	E1	α(K)exp=0.0063 12.
[x]398.89 8	0.051 10						
[x]400.63 16	0.028 11						
[x]404.17 4	1.85 11					E1	
404.17[g] 4	1.85 11	404.130	1/2−	0.0	3/2+	E1	α(K)exp<0.011.
407.30 7	0.171 14	414.925	1/2+	7.536	5/2+		
413.75 15	0.18 4	734.873	1/2+,3/2+	321.113	3/2+		
414.97 6	3.04 18	414.925	1/2+	0.0	3/2+	M1	
[x]417.13 17	0.021 8						
[x]419.93 17	0.011 7						
[x]422.71 9	0.024 10						
[x]425.97 19	0.029 9						
[x]428.18 19	0.024 10						
433.11[&b] 10	0.071 11	524.360	(5/2+)	90.875	5/2−		
435.43 20	0.028 8	630.20	1/2−,3/2−	194.656	(5/2)		
439.53 6	0.280 22	447.05	(7/2+)	7.536	5/2+		
442.51 6	0.75 5	450.051	(5/2)−	7.536	5/2+		
445.15 6	0.164 16	481.088	(3/2)+	35.844	3/2−		
447.27 6	0.050 8	630.20	1/2−,3/2−	182.902	5/2−		
[x]452.2 3	0.017 9						

$^{153}_{62}$Sm$_{91}$-7

^{152}Sm(n,γ) E=th (continued)

γ(^{153}Sm) (continued)

E_γ[†]	I_γ[‡#m]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	Comments
456.2 3	0.018 9	630.20	1/2⁻,3/2⁻	174.173	(7/2⁻)		
[x]459.92 6	0.32 3						
470.65[&ap] 6	1.86 13	524.360	(5/2⁺)	53.534	7/2⁺		α(K)exp=0.0086 33.
473.63[o] 6	2.23[o] 16	481.088	(3/2)⁺	7.536	5/2⁺	[k]	α(K)exp=0.017 3.
473.63[o] 6	2.23[o] 16	750.32	(3/2)⁻	276.713	(3/2)⁺	[k]	α(K)exp=0.017 3.
481.14 6	0.69 6	481.088	(3/2)⁺	0.0	3/2⁺		
[x]482.51 6	0.175 18						
488.57 12	0.135 15	524.360	(5/2⁺)	35.844	3/2⁻		
[x]491.55 12	0.040 10						
[x]494.35 12	0.098 20						
[x]502.21 18	0.23 3						
503.52[g] 18	0.075 15	630.20	1/2⁻,3/2⁻	126.412	(1/2⁻)		
516.72 10	0.47 3	524.360	(5/2⁺)	7.536	5/2⁺		
[x]518.02 13	0.115 18						
[x]521.12 20	0.042 13						
[x]523.06 20	0.104 21						
524.22 20	0.15 3	524.360	(5/2⁺)	0.0	3/2⁺		
[x]530.8 3	0.059 24						
[x]532.9[a] 3	0.14 3						
[x]535.4 3	0.14 4						
539.2 3	0.11 3	630.20	1/2⁻,3/2⁻	90.875	5/2⁻		
540.5 3	0.13 3	734.873	1/2⁺,3/2⁺	194.656	(5/2)		
[x]549.7 3	0.064 23						
551.7 3	0.095 24	734.873	1/2⁺,3/2⁺	182.902	5/2⁻		
[x]559.88 15	0.13 3						
[x]561.61 22	0.052 13						
564.70 22	0.14 3	630.20	1/2⁻,3/2⁻	65.469	9/2⁺		
567.50 15	0.52 6	750.32	(3/2)⁻	182.902	5/2⁻		
568.52 24	0.23 3	695.80	(1/2)⁻	127.298	3/2⁻		
[x]574.1 5	0.10 3						
[x]575.0 5	0.11 3						
579.9[g] 5	0.16 4	984.2	3/2⁺	404.130	1/2⁻		
583.0[p] 5	0.28 4	695.80	(1/2)⁻	112.955?			
[x]586.4[a] 5	0.27 4						
[x]589.8[a] 5	0.18 4						
[x]593.77 17	0.22 3						
[x]604.2 3	0.073 22						
[x]605.9 3	0.19 3						
[x]610.1 3	0.030 15						
[x]614.44 16	0.170 21						
[x]618.9 4	0.10 3						
622.76 10	1.42 10	630.20	1/2⁻,3/2⁻	7.536	5/2⁺		
[x]627.6 3	0.36 4						

γ(^{153}Sm) (continued)

E_γ †	I_γ ‡#m	E_i(level)	J_i^π	E_f	J_f^π	Comments
630.24 *10*	1.82 *13*	630.20	$1/2^-,3/2^-$	0.0	$3/2^+$	α(K)exp<0.009.
^{x}646.28 *22*	0.23 *3*					
^{x}649.8 *3*	0.09 *3*					
659.95 *10*	2.07 *14*	695.80	$(1/2)^-$	35.844	$3/2^-$	α(K)exp<0.008.
^{x}662.9 *5*	0.16 *4*					
^{x}675.3 *3*	0.16 *4*					
681.7 *3*	0.29 *5*	734.873	$1/2^+,3/2^+$	53.534	$7/2^+$	
^{x}689.4 *4*	0.26 *4*					
^{x}693.2 *4*	0.28 *5*					
^{x}698.41 *24*	0.35 *5*					
702.61^{g} *24*	0.22 *5*	1106.74	$3/2^+$	404.130	$1/2^-$	
^{x}707.08 *25*	0.23 *5*					
^{x}714.91 *20*	0.99 *10*					
^{x}722.0 *5*	0.10 *4*					
727.37 *25*	0.42 *6*	734.873	$1/2^+,3/2^+$	7.536	$5/2^+$	
734.89 *13*	1.65 *17*	734.873	$1/2^+,3/2^+$	0.0	$3/2^+$	
743.1 *5*	0.18 *6*	750.32	$(3/2)^-$	7.536	$5/2^+$	
^{x}746.7 *5*	0.24 *7*					
749.9 *5*	0.19 *6*	750.32	$(3/2)^-$	0.0	$3/2^+$	
^{x}753.6 *3*	0.55 *6*					
^{x}757.6 *6*	0.08 *4*					
^{x}767.62 *24*	0.69 *7*					
^{x}772.3 *3*	0.41 *7*					
^{x}780.72 *24*	0.54 *6*					
^{x}788.72 *24*	0.99 *10*					
^{x}808.4 *3*	0.26 *5*					
^{x}817.4 *7*	0.10 *5*					
^{x}825.2 *3*	0.49 *8*					
^{x}834.1 *3*	0.48 *8*					
^{x}839.0 *3*	0.87 *10*					
^{x}847.2 *7*	0.10 *9*					
858.0^{g} *7*	0.23 *7*	984.2	$3/2^+$	126.412	$(1/2^-)$	
^{x}871.3 *5*	0.28 *8*					
^{x}878.6 *4*	0.90 *14*					
^{x}891.4 *9*	0.21 *8*					
^{x}902.9 *4*	0.73 *12*					
^{x}912.0 *4*	0.35 *7*					
^{x}924.4 *4*	0.59 *11*					
^{x}941.2 *4*	0.72 *11*					
^{x}954.2 *7*	0.60 *10*					
^{x}969.9 *7*	0.66 *13*					
979.4^{g} *8*	1.18 *19*	1106.74	$3/2^+$	127.298	$3/2^-$	
^{x}988.6 *9*	0.37 *11*					
^{x}1023.8 *9*	0.57 *17*					

^{152}Sm(n,γ) E=th (continued)

γ(^{153}Sm) (continued)

E_γ [†]	I_γ [‡#m]	E_i(level)	J^π_i	E_f	J^π_f	E_γ [†]	I_γ [‡#m]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [@]
[x]1041.3 *9*	0.71 *18*					4951.5[e] *6*	0.12 *2*	(5868.41)	1/2$^+$	916.8	1/2$^+$,3/2$^+$	
3225.6[c] *7*	0.19 *3*	(5868.41)	1/2$^+$	2642.8		5117.8 *5*	0.39 *3*	(5868.41)	1/2$^+$	750.32	(3/2)$^-$	
3371.8[c] *12*	0.57 *2*	(5868.41)	1/2$^+$	2496.6		5133.3[e] *8*	0.04 *2*	(5868.41)	1/2$^+$	734.873	1/2$^+$,3/2$^+$	
3934.6[c] *6*	0.47 *3*	(5868.41)	1/2$^+$	1933.8		5172.7 *3*	0.58 *4*	(5868.41)	1/2$^+$	695.80	(1/2)$^-$	
3943.5[c] *8*	0.34 *3*	(5868.41)	1/2$^+$	1924.9		5220.4[e] *10*	0.016 *10*	(5868.41)	1/2$^+$	647.9?		
4310.6[f] *15*	0.28 *5*	(5868.41)	1/2$^+$	1557.7?	1/2$^+$,3/2$^+$	5237.8 *3*	1.02 *6*	(5868.41)	1/2$^+$	630.20	1/2$^-$,3/2$^-$	E1
4341.4[f] *15*	0.87 *9*	(5868.41)	1/2$^+$	1526.9?	1/2$^-$,3/2$^-$	5283.9[e] *11*	0.034 *11*	(5868.41)	1/2$^+$	584.31?		
4468.3[e] *8*	0.13 *2*	(5868.41)	1/2$^+$	1400.0?		5386.8 *4*	0.40 *5*	(5868.41)	1/2$^+$	481.088	(3/2)$^+$	M1
4474.4[e] *8*	0.11 *2*	(5868.41)	1/2$^+$	1393.9?		5453.1 *7*	0.22 *2*	(5868.41)	1/2$^+$	414.925	1/2$^+$	M1
4505.6 *4*	0.70 *6*	(5868.41)	1/2$^+$	1362.7	1/2$^-$,3/2$^-$	5463.0 *5*	0.30 *3*	(5868.41)	1/2$^+$	405.470	3/2$^-$	E1
4524.3 *5*	0.28 *3*	(5868.41)	1/2$^+$	1344.0	1/2$^+$,3/2$^+$	5506.4[d] *5*	0.010 *3*	(5868.41)	1/2$^+$	362.286	(5/2$^+$)	(E2)[j]
4545.7 *4*	0.90 *10*	(5868.41)	1/2$^+$	1322.6	1/2$^-$,3/2$^-$	5512.8[d] *7*	0.007 *3*	(5868.41)	1/2$^+$	356.686	(5/2)$^+$	
4644.6 *10*	0.14 *2*	(5868.41)	1/2$^+$	1223.7	1/2$^+$,3/2$^+$	5547.0 *10*	0.104 *20*	(5868.41)	1/2$^+$	321.113	3/2$^+$	M1
4697.2 *7*	0.94 *10*	(5868.41)	1/2$^+$	1171.1	1/2$^-$,3/2$^-$	5591.6 *12*	0.084 *9*	(5868.41)	1/2$^+$	276.713	(3/2)$^+$	M1
4757.9 *7*	0.09 *3*	(5868.41)	1/2$^+$	1110.4	1/2$^+$,3/2$^+$	5740.9 *3*	4.35 *17*	(5868.41)	1/2$^+$	127.298	3/2$^-$	E1
4850[dl]	0.09 *2*	(5868.41)	1/2$^+$	1018.3		5832.6 *3*	0.99 *5*	(5868.41)	1/2$^+$	35.844	3/2$^-$	E1
4864.0[dl]	0.37 *3*	(5868.41)	1/2$^+$	1004.3		5861.4 *10*	0.010 *6*	(5868.41)	1/2$^+$	7.536	5/2$^+$	(E2)[j]
4884.0 *8*	0.36 *4*	(5868.41)	1/2$^+$	984.3	1/2$^-$,3/2$^-$	5868.4 *6*	0.148 *16*	(5868.41)	1/2$^+$	0.0	3/2$^+$	M1

† From 1969Sm04 for secondary γ's. For primary γ's, from unweighted average of values of 1969Sm04 (with 1.0 keV subtracted from published value to make them more consistent with other values), 1971Be41, and 1982Ba15. Primary γ's that are reported in only one reference are indicated.

‡ Photons per 100 captures as normalized by 1969Sm04. For secondary γ's, the I_γ were normalized to 28 γ's per 100 neutron captures in ^{152}Sm for the 103.2-keV γ emitted in the β- decay of ^{153}Sm when the beta-decay rate is in equilibrium with the neutron-capture rate. For primary transitions, the I_γ were normalized to the I_γ values observed in the ^{149}Sm(n,γ) reaction as given by 1963Gr18.

\# Unweighted average of values of 1969Sm04, 1971Be41, and 1982Ba15 with values of latter two references normalized to 4.35 for 5740 γ. Uncertainty is taken as typical value from the three measurements. See flags of γ energies to indicate when only one value is available.

@ Listed assignments are those deduced by 1969Sm04 from comparison of experimental and theoretical conversion coefficients.

& Questionable isotopic assignment.

a Possible doublet.

b Doublet, but placed only once.

c Primary γ from 1982Ba15 only.

d Primary γ from 1969Sm04 only.

e Primary γ from 1971Be41 only.

f Primary γ from 1969Re04 only.

g placement from 1997GoZN.

h 1969Sm04 listing of 194.80 assumed by evaluator to be a misprint.

$^{153}_{62}Sm_{91}$-10

γ(^{153}Sm) (continued)

[i] α_K=0.11 *4* for the doublet, compared to 0.043 for for E2 and 0.067 for M1.
[j] (E2,M1) from conversion data; placement in level scheme rules out M1.
[k] Assigned M1,E2 for doubly placed γ.
[l] Doublet.
[m] Intensity per 100 neutron captures.
[n] 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.
[o] Multiply placed with undivided intensity.
[p] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

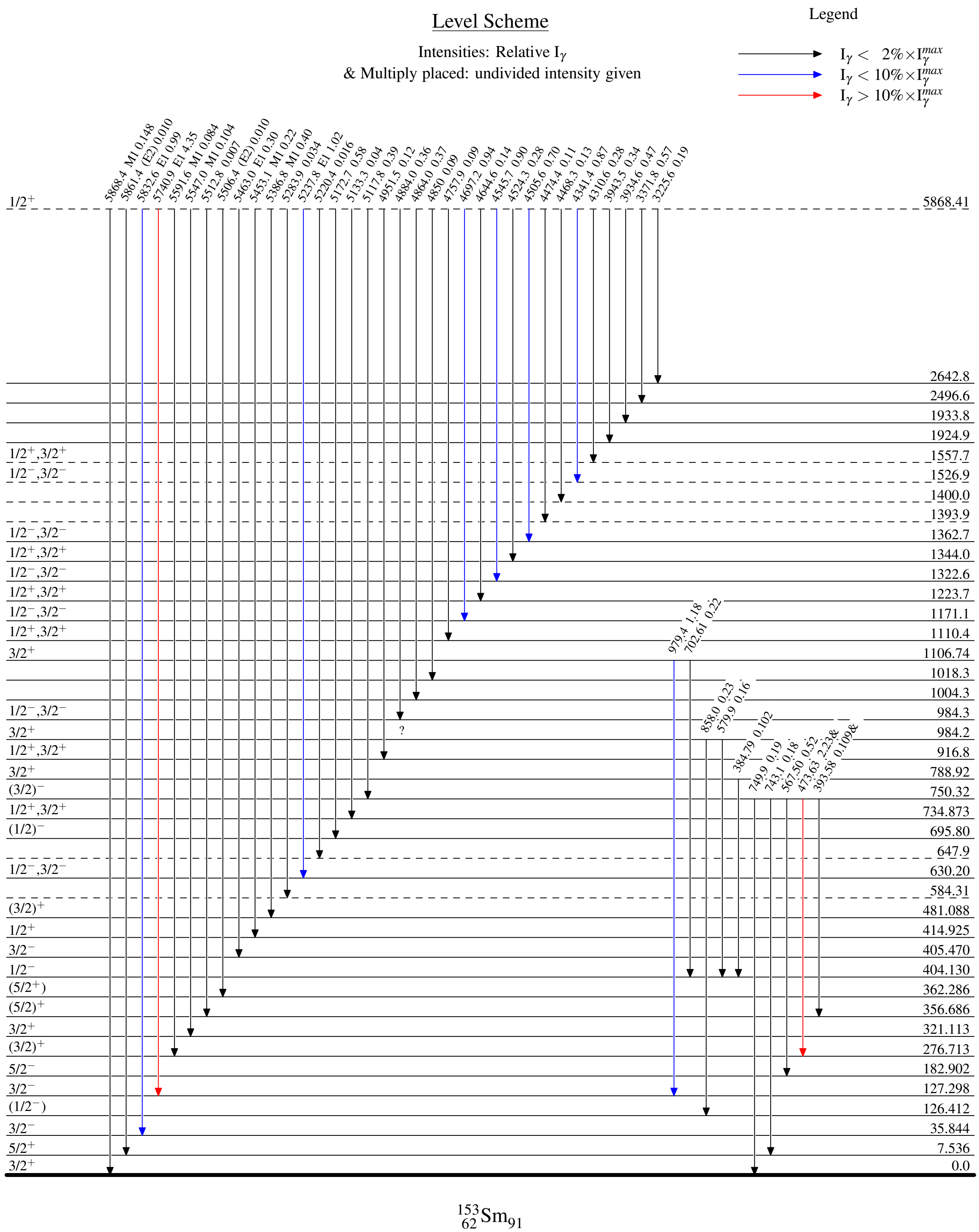
$^{153}_{62}$Sm$_{91}$-11

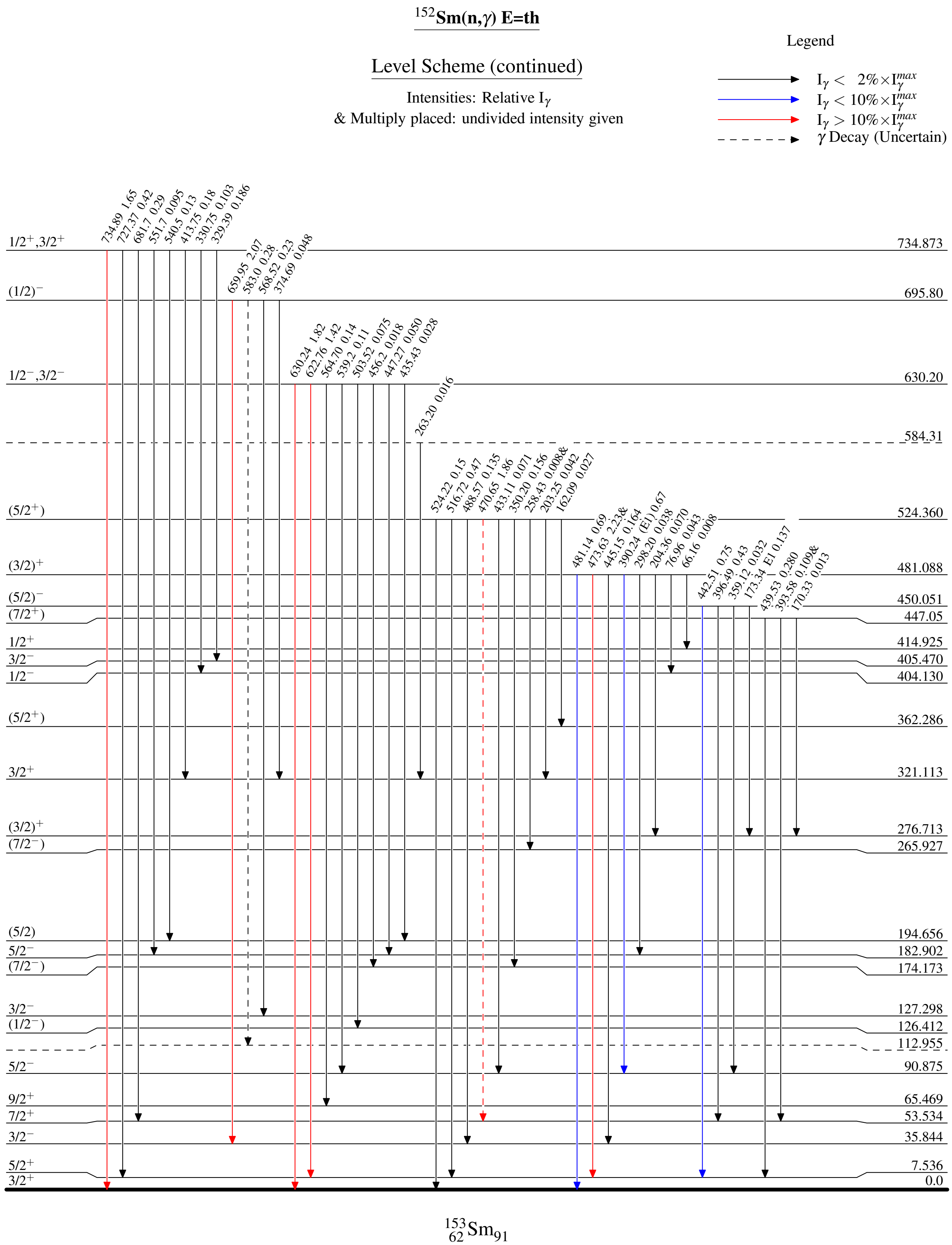
^{152}Sm(n,γ) E=th

Level Scheme

Intensities: Relative I_γ

& Multiply placed: undivided intensity given




^{152}Sm(n,γ) E=th
Level Scheme (continued)
Intensities: Relative Iγ
& Multiply placed: undivided intensity given
Legend
Iγ < 2%×Iγ^max
Iγ < 10%×Iγ^max
Iγ > 10%×Iγ^max
γ Decay (Uncertain)
1/2+,3/2+ 734.873
(1/2)− 695.80
1/2−,3/2− 630.20
584.31
(5/2+) 524.360
(3/2)+ 481.088
(5/2)− 450.051
(7/2+) 447.05
1/2+ 414.925
3/2− 405.470
1/2− 404.130
(5/2+) 362.286
3/2+ 321.113
(3/2)+ 276.713
(7/2−) 265.927
(5/2) 194.656
5/2− 182.902
(7/2−) 174.173
3/2− 127.298
(1/2−) 126.412
112.955
5/2− 90.875
9/2+ 65.469
7/2+ 53.534
3/2− 35.844
5/2+ 7.536
3/2+ 0.0
$^{153}_{62}$Sm$_{91}$

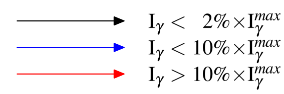
$^{152}Sm(n,\gamma)$ E=th

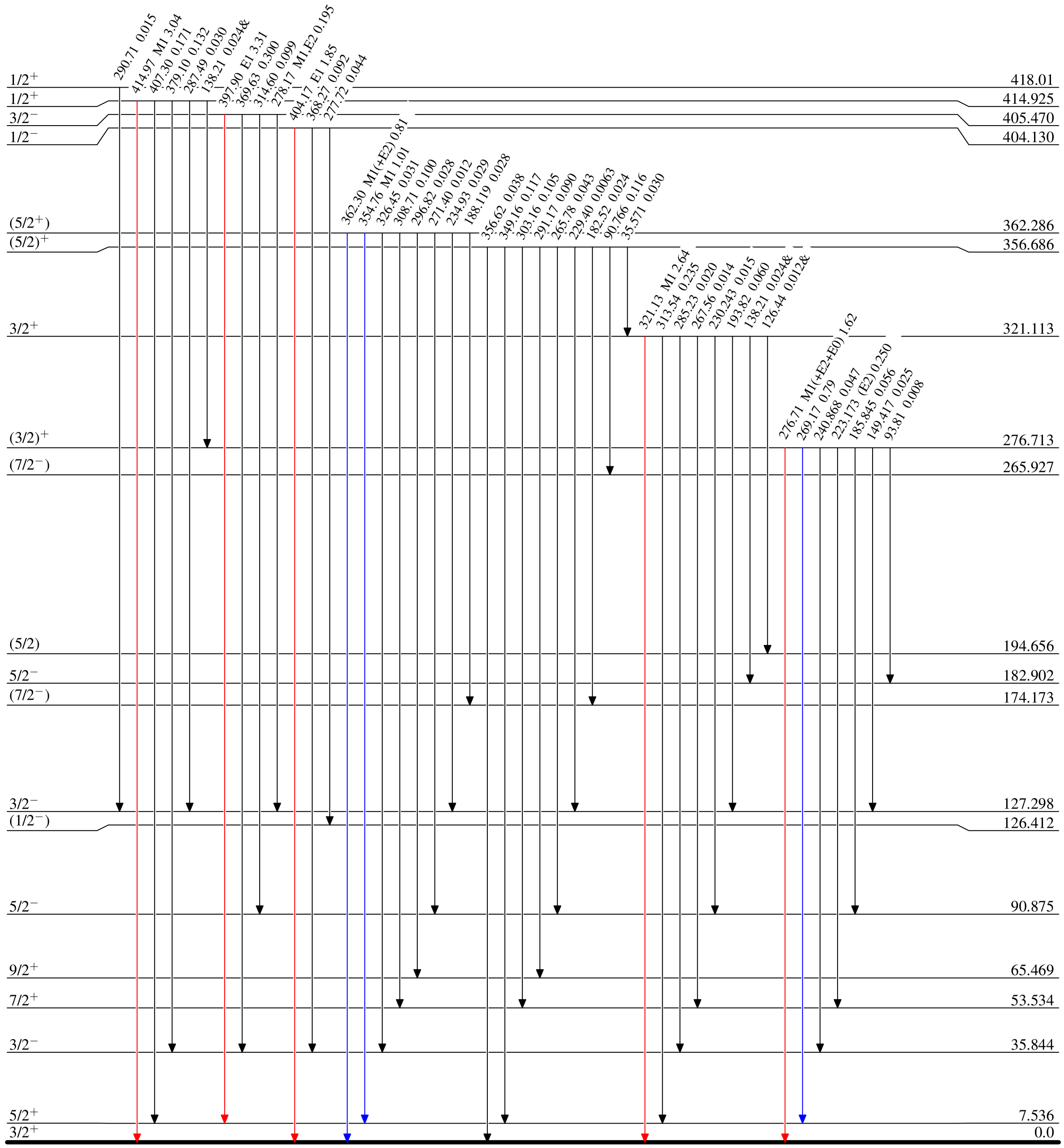
Level Scheme (continued)

Intensities: Relative I_γ

& Multiply placed: undivided intensity given

Legend





$^{153}_{62}Sm_{91}$

^{152}Sm(n,γ) E=th

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given