Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. M. Symochko, E. Browne, J. K. Tuli	NDS 110,2945 (2009)	1-Dec-2008

Q(β^-)=−9.6×10^3 *syst*; S(n)=1.03×10^4 *syst*; S(p)=3.47×10^3 *20*; Q(α)=1.64×10^3 *20* 2012Wa38
Note: Current evaluation has used the following Q record −9623 syst 10290 syst 3.47E3 20 *1*.64E3 20 2009AuZZ,2003Au03.
The uncertainties given by 2003Au03 for Q(β^-) and S(n) are 450 and 280, respectively.
Q(εp)=6200 *200* (2003Au03).
Source: ^{92}Mo(^{32}S,2p3n) E=190 MeV, on-line mass separation (1978Bo20,1976Bo36,1975Bo11); scin, semi; measured delayed-p, delayed (p)(β^+)-, delayed pγ-coin.
Others: ^{106}Cd(^{16}O,3n) E=70-110 MeV (1974Bo20), 1985TaZN, 1988WiZN.
β strength function: see 1978Bo20.

^{119}Ba Levels

Cross Reference (XREF) Flags

A ^{58}Ni(^{64}Zn,2pnγ),

E(level)[†]	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0[&]	(5/2$^+$)	5.4 s *3*	A	%ε+%β^+=100; %εp<25 Delayed proton precursor (1975Bo11,1976Bo36,1978Bo20), p/β^+=0.25 *2* (1978Bo20). T$_{1/2}$: from timing of delayed protons (1978Bo20). Other: 5.0 s *6* (1974Bo20). J$^\pi$: 5/2$^+$ proposed by 1976Bo36 from comparison of the measured delayed- proton spectrum with that calculated using the statistical model. In reaction work, 2000Sm05 reported two low-lying states with proposed tentative spins/parities of 3/2$^+$ and 5/2$^-$. Either of these could be the ground state.
0+x[‡]	(3/2$^+$)		A	
0+y[‡@]	(5/2$^-$)		A	
54.2+x[a] *3*	(5/2$^+$)		A	
60.5+y[#] *3*	(7/2$^-$)		A	
85.1+x *3*	(5/2$^+$)		A	
174.5+y[@] *3*	(9/2$^-$)		A	
177.7+x[&] *2*	(7/2$^+$)		A	
267.5+y[#] *3*	(11/2$^-$)		A	
339.7+x[a] *3*	(9/2$^+$)		A	
518.4+y[@] *5*	(13/2$^-$)		A	
523.9+x[&] *4*	(11/2$^+$)		A	
631.5+y[#] *4*	(15/2$^-$)		A	
751.6+x[a] *4*	(13/2$^+$)		A	
990.8+x[&] *4*	(15/2$^+$)		A	
1021.0+y[@] *4*	(17/2$^-$)		A	
1144.0+y[#] *5*	(19/2$^-$)		A	
1276.3+x[a] *5*	(17/2$^+$)		A	
1562.4+x[&] *5*	(19/2$^+$)		A	
1649.0+y[@] *5*	(21/2$^-$)		A	
1779.6+y[#] *5*	(23/2$^-$)		A	
1894.7+x[a] *5*	(21/2$^+$)		A	
2222.3+x[&] *5*	(23/2$^+$)		A	

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Adopted Levels, Gammas (continued)

^{119}Ba Levels (continued)

E(level)†	Jπ	XREF	E(level)†	Jπ	XREF	E(level)†	Jπ	XREF
2365.1+y@ 5	(25/2−)	A	5501.8+y@ 7	(41/2−)	A	10419.5+x& 10	(59/2+)	A
2508.3+y# 6	(27/2−)	A	5884.1+y# 8	(43/2−)	A	10421.2+y 10	(59/2−)	A
2583.9+xa 5	(25/2+)	A	6003.8+xa 8	(41/2+)	A	11409.3+y?@ 10	(61/2−)	A
2952.0+x& 6	(27/2+)	A	6288.9+x& 8	(43/2+)	A	11570.1+y# 14	(63/2−)	A
3109.5+y@ 6	(29/2−)	A	6496.1+y@ 8	(45/2−)	A	11599.9+y? 17	(63/2−)	A
3295.7+y# 6	(31/2−)	A	6886.2+y# 9	(47/2−)	A	11648.0+x& 11	(63/2+)	A
3315.6+xa 6	(29/2+)	A	7063.1+x?a 8	(45/2+)	A	12807.6+y# 15	(67/2−)	A
3720.5+x& 7	(31/2+)	A	7231.5+x& 9	(47/2+)	A	12964.2+x& 11	(67/2+)	A
3837.2+y@ 6	(33/2−)	A	7592.2+y@ 9	(49/2−)	A	14145.1+y# 15	(71/2−)	A
4110.4+xa 7	(33/2+)	A	7978.5+y# 9	(51/2−)	A	14361.8+x& 12	(71/2+)	A
4113.6+y# 7	(35/2−)	A	8220.1+x& 9	(51/2+)	A	15674.3+y# 15	(75/2−)	A
4516.7+x& 7	(35/2+)	A	8779.5+y@ 9	(53/2−)	A	15837.5+x& 12	(75/2+)	A
4616.3+y@ 7	(37/2−)	A	9154.9+y# 10	(55/2−)	A	17415.5+x& 12	(79/2+)	A
4966.3+y# 7	(39/2−)	A	9279.6+x& 10	(55/2+)	A	17451.1+y?# 16	(79/2−)	A
5007.2+xa 7	(37/2+)	A	10039.2+y@ 10	(57/2−)	A	19082.3+x?& 13	(83/2+)	A
5375.1+x& 8	(39/2+)	A	10361.9+y# 14	(59/2−)	A			

† From least-squares fit to Eγ's.

‡ Either of the two low-lying levels with tentative spins (3/2+) and 5/2− may be the ground state of ^{119}Ba, although, 5/2+ for the g.s. is proposed based on the delayed proton spectrum from ^{119}Ba decay.

Band(A): $\nu h_{11/2}$, α=−1/2.

@ Band(a): $\nu h_{11/2}$, α=+1/2.

& Band(B): $\nu(g_{7/2}d_{5/2})^1$, α=−1/2.

a Band(b): $\nu(g_{7/2}d_{5/2})^1$, α=+1/2. It is assumed by 2000Sm05 that the band starts at 5/2+ and the four transitions (54, 85, 93 and 178 keV) below the 5/2+ and 7/2+ members of this band are not a continuation of the band due to their low intensities.

γ(^{119}Ba)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.†
54.2+x	(5/2+)	54.3 3	100	0+x	(3/2+)	
60.5+y	(7/2−)	60.1 3	100	0+y	(5/2−)	D+Q
85.1+x	(5/2+)	85.1 3	100	0+x	(3/2+)	
174.5+y	(9/2−)	113.6 3	<6.7‡	60.5+y	(7/2−)	D+Q
		174.9 3	100 33	0+y	(5/2−)	Q
177.7+x	(7/2+)	92.6 3	78 44	85.1+x	(5/2+)	(D+Q)
		123.5 3	100 22	54.2+x	(5/2+)	D+Q
		177.6 3	44 11	0+x	(3/2+)	Q
267.5+y	(11/2−)	92.8 3	2.6 6	174.5+y	(9/2−)	D+Q
		207.0 3	100 13	60.5+y	(7/2−)	Q
339.7+x	(9/2+)	161.9 3	67 7	177.7+x	(7/2+)	D+Q
		286&	100 14	54.2+x	(5/2+)	Q
518.4+y	(13/2−)	250.9 3	30.8 16	267.5+y	(11/2−)	D+Q
		344.7 3	100 20	174.5+y	(9/2−)	
523.9+x	(11/2+)	184.0 3	25 4	339.7+x	(9/2+)	D+Q
		346.3 3	100 11	177.7+x	(7/2+)	Q
631.5+y	(15/2−)	112.6 3	<1.8‡	518.4+y	(13/2−)	D+Q
		363.7 3	100 14	267.5+y	(11/2−)	Q
751.6+x	(13/2+)	227.5 3	45.4 23	523.9+x	(11/2+)	D+Q

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Adopted Levels, Gammas (continued)

γ(^{119}Ba) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]
751.6+x	(13/2$^+$)	411.9 *3*	100 *15*	339.7+x	(9/2$^+$)	Q
990.8+x	(15/2$^+$)	239.0 *3*	19.7 *10*	751.6+x	(13/2$^+$)	D+Q
		467.1 *3*	100 *5*	523.9+x	(11/2$^+$)	Q
1021.0+y	(17/2$^-$)	389.1 *3*	11.7 *7*	631.5+y	(15/2$^-$)	D+Q
		502.4 *3*	100 *17*	518.4+y	(13/2$^-$)	
1144.0+y	(19/2$^-$)	512.5 *3*	100	631.5+y	(15/2$^-$)	Q
1276.3+x	(17/2$^+$)	285[&]	17 *8*	990.8+x	(15/2$^+$)	
		524.6 *3*	100 *10*	751.6+x	(13/2$^+$)	Q
1562.4+x	(19/2$^+$)	286.2 *3*	8.8 *22*	1276.3+x	(17/2$^+$)	
		571.7 *3*	100 *5*	990.8+x	(15/2$^+$)	Q
1649.0+y	(21/2$^-$)	505.3 *3*	5.6 *15*	1144.0+y	(19/2$^-$)	D+Q
		627.9 *3*	100 *19*	1021.0+y	(17/2$^-$)	Q
1779.6+y	(23/2$^-$)	635.4 *3*	100	1144.0+y	(19/2$^-$)	Q
1894.7+x	(21/2$^+$)	332.8 *3*	≈9[@]	1562.4+x	(19/2$^+$)	D+Q
		618.3 *3*	<100[#]	1276.3+x	(17/2$^+$)	Q
2222.3+x	(23/2$^+$)	659.6 *3*	100	1562.4+x	(19/2$^+$)	
2365.1+y	(25/2$^-$)	585.2 *3*	≈4[@]	1779.6+y	(23/2$^-$)	D+Q
		716.4 *3*	100 *5*	1649.0+y	(21/2$^-$)	Q
2508.3+y	(27/2$^-$)	728.7 *3*	100	1779.6+y	(23/2$^-$)	Q
2583.9+x	(25/2$^+$)	361.1 *3*	≈9[@]	2222.3+x	(23/2$^+$)	
		689.5 *3*	<100[#]	1894.7+x	(21/2$^+$)	Q
2952.0+x	(27/2$^+$)	729.8 *3*	100	2222.3+x	(23/2$^+$)	
3109.5+y	(29/2$^-$)	601.3 *3*	≈6[@]	2508.3+y	(27/2$^-$)	D+Q
		744.4 *3*	100 *5*	2365.1+y	(25/2$^-$)	Q
3295.7+y	(31/2$^-$)	787.2 *3*	100	2508.3+y	(27/2$^-$)	Q
3315.6+x	(29/2$^+$)	363.8 *3*	≈4[@]	2952.0+x	(27/2$^+$)	
		731.6 *3*	100 *19*	2583.9+x	(25/2$^+$)	
3720.5+x	(31/2$^+$)	768.5 *3*	100	2952.0+x	(27/2$^+$)	
3837.2+y	(33/2$^-$)	541.3 *3*	≈7[@]	3295.7+y	(31/2$^-$)	D+Q
		727.9 *3*	<100[#]	3109.5+y	(29/2$^-$)	Q
4110.4+x	(33/2$^+$)	794.8 *3*	100	3315.6+x	(29/2$^+$)	
4113.6+y	(35/2$^-$)	817.9 *3*	100	3295.7+y	(31/2$^-$)	Q
4516.7+x	(35/2$^+$)	796.2 *3*	100	3720.5+x	(31/2$^+$)	
4616.3+y	(37/2$^-$)	779.1 *3*	100	3837.2+y	(33/2$^-$)	Q
4966.3+y	(39/2$^-$)	852.7 *3*	100	4113.6+y	(35/2$^-$)	Q
5007.2+x	(37/2$^+$)	896.8 *3*	100	4110.4+x	(33/2$^+$)	
5375.1+x	(39/2$^+$)	858.4 *3*	100	4516.7+x	(35/2$^+$)	
5501.8+y	(41/2$^-$)	885.5 *3*	100	4616.3+y	(37/2$^-$)	Q
5884.1+y	(43/2$^-$)	917.8 *3*	100	4966.3+y	(39/2$^-$)	Q
6003.8+x	(41/2$^+$)	996.6 *3*	100	5007.2+x	(37/2$^+$)	
6288.9+x	(43/2$^+$)	913.8 *3*	100	5375.1+x	(39/2$^+$)	
6496.1+y	(45/2$^-$)	994.3 *3*	100	5501.8+y	(41/2$^-$)	Q
6886.2+y	(47/2$^-$)	1002.1 *3*	100	5884.1+y	(43/2$^-$)	Q
7063.1+x?	(45/2$^+$)	1059.3 *3*	100	6003.8+x	(41/2$^+$)	
7231.5+x	(47/2$^+$)	942.6 *3*	100	6288.9+x	(43/2$^+$)	
7592.2+y	(49/2$^-$)	1096.1 *3*	100	6496.1+y	(45/2$^-$)	
7978.5+y	(51/2$^-$)	1092.3 *3*	100	6886.2+y	(47/2$^-$)	
8220.1+x	(51/2$^+$)	988.6 *3*	100	7231.5+x	(47/2$^+$)	
8779.5+y	(53/2$^-$)	1187.3 *3*	100	7592.2+y	(49/2$^-$)	
9154.9+y	(55/2$^-$)	1176.3 *3*	100	7978.5+y	(51/2$^-$)	
9279.6+x	(55/2$^+$)	1059.5 *3*	100	8220.1+x	(51/2$^+$)	
10039.2+y	(57/2$^-$)	1259.7 *3*	100	8779.5+y	(53/2$^-$)	

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Adopted Levels, Gammas (continued)

$\gamma(^{119}Ba)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π
10361.9+y	$(59/2^-)$	1207[&]	100	9154.9+y	$(55/2^-)$
10419.5+x	$(59/2^+)$	1139.9 *3*	100	9279.6+x	$(55/2^+)$
10421.2+y	$(59/2^-)$	1266.3 *3*	100	9154.9+y	$(55/2^-)$
11409.3+y?	$(61/2^-)$	1370.1[a] *3*	100	10039.2+y	$(57/2^-)$
11570.1+y	$(63/2^-)$	1208.2 *3*	100	10361.9+y	$(59/2^-)$
11599.9+y?	$(63/2^-)$	1238[&]	100	10361.9+y	$(59/2^-)$
11648.0+x	$(63/2^+)$	1228.5 *3*	100	10419.5+x	$(59/2^+)$
12807.6+y	$(67/2^-)$	1237.5 *3*	100	11570.1+y	$(63/2^-)$
12964.2+x	$(67/2^+)$	1316.2 *3*	100	11648.0+x	$(63/2^+)$
14145.1+y	$(71/2^-)$	1337.5 *3*	100	12807.6+y	$(67/2^-)$
14361.8+x	$(71/2^+)$	1397.6 *3*	100	12964.2+x	$(67/2^+)$
15674.3+y	$(75/2^-)$	1529.2 *3*	100	14145.1+y	$(71/2^-)$
15837.5+x	$(75/2^+)$	1475.7 *3*	100	14361.8+x	$(71/2^+)$
17415.5+x	$(79/2^+)$	1578.0 *3*	100	15837.5+x	$(75/2^+)$
17451.1+y?	$(79/2^-)$	1776.8 *3*	100	15674.3+y	$(75/2^-)$
19082.3+x?	$(83/2^+)$	1666.8[a] *3*	100	17415.5+x	$(79/2^+)$

† From γ-ray angular distribution data in ^{58}Ni(^{64}Zn,2pnγ). The mult=Q corresponds to $\Delta J=2$ and D+Q to $\Delta J=1$ transitions.
‡ Composite intensity for 113.6γ+112.6γ is listed in the dataset.
# In reaction dataset, intensity is for a composite peak, the other component contributed by an impurity.
@ Estimated intensity, not measured.
& Estimated energy, not measured.
a Placement of transition in the level scheme is uncertain.

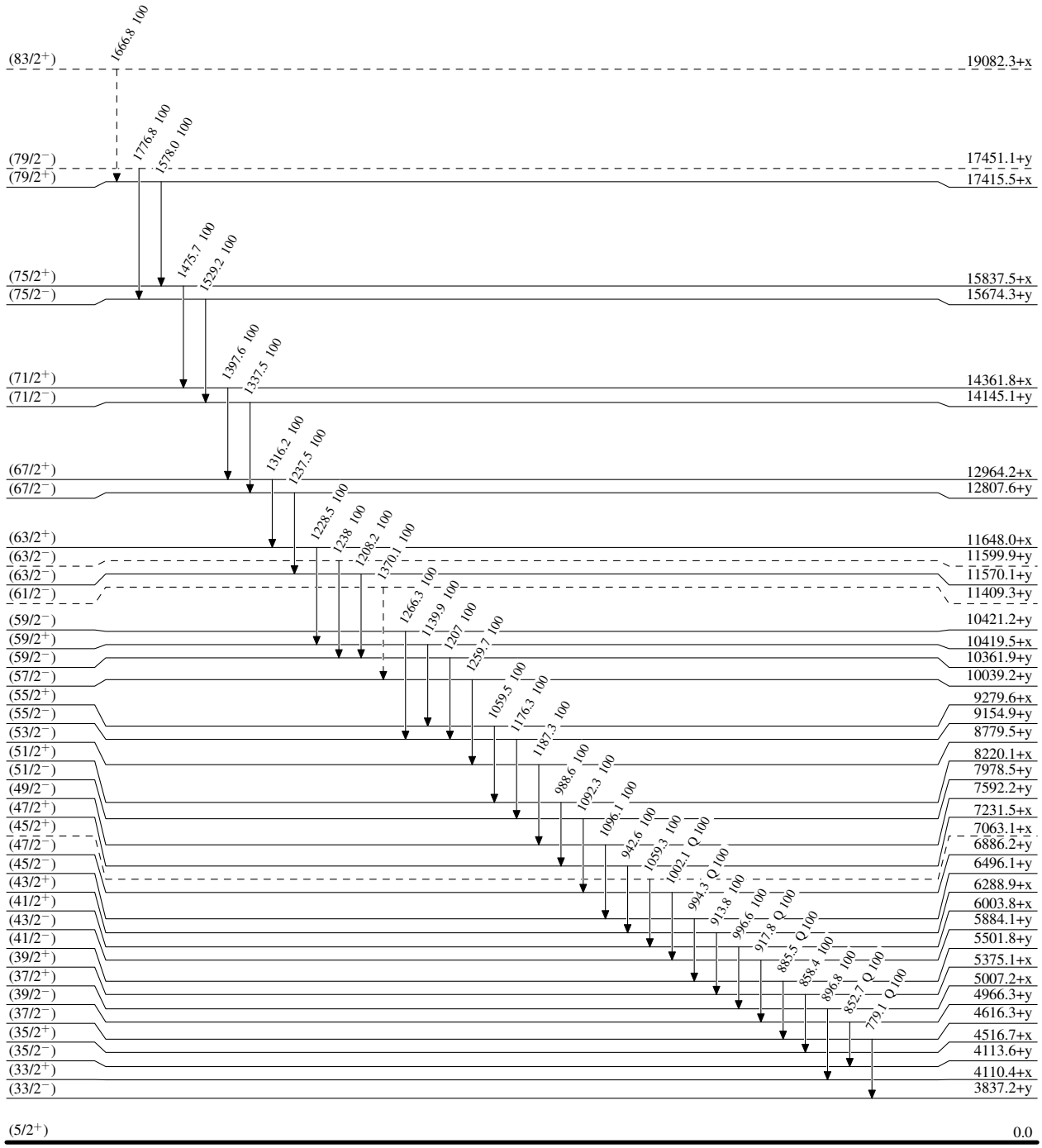
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

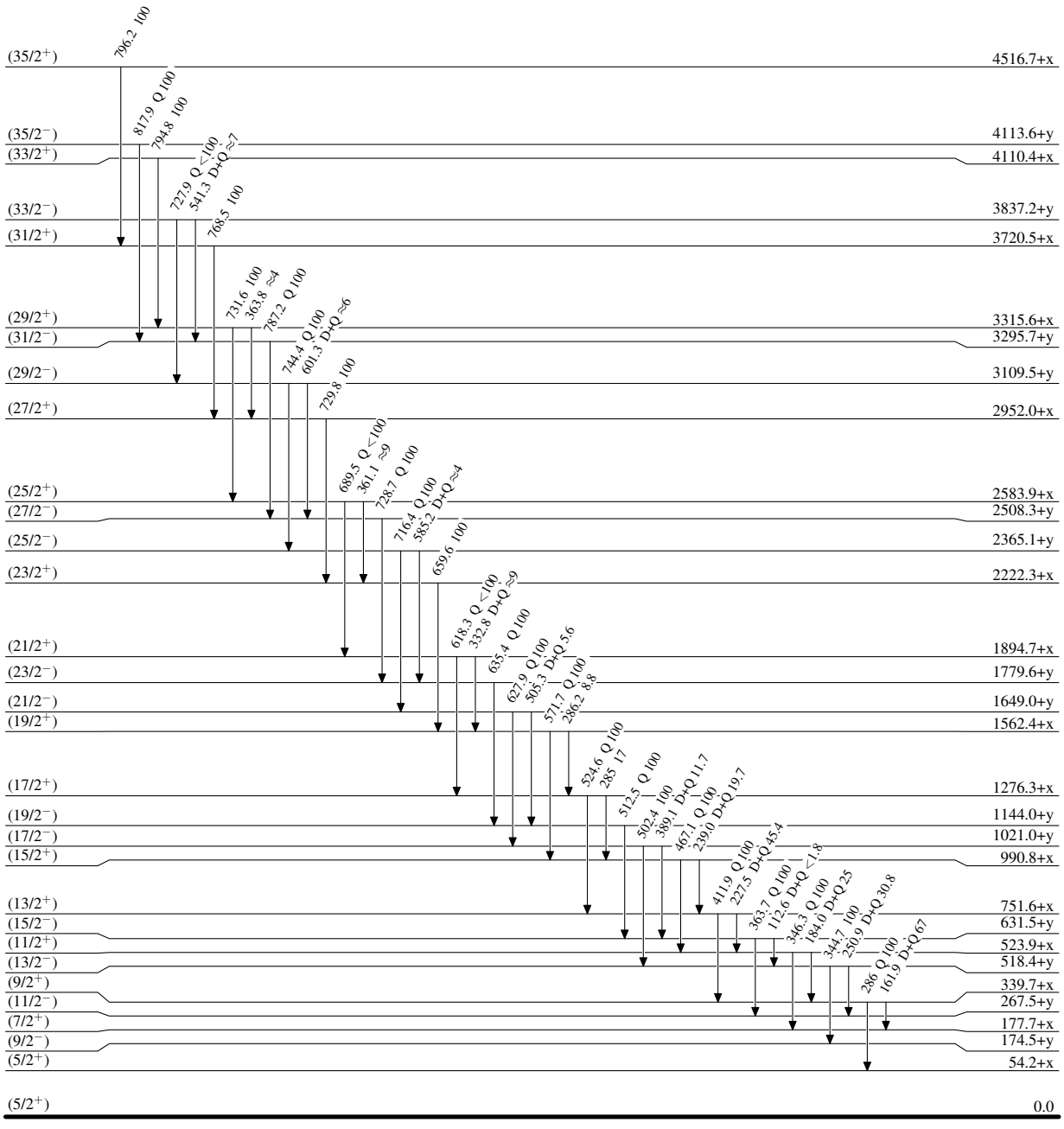


$^{119}_{56}Ba_{63}$

Adopted Levels, Gammas

Level Scheme (continued)

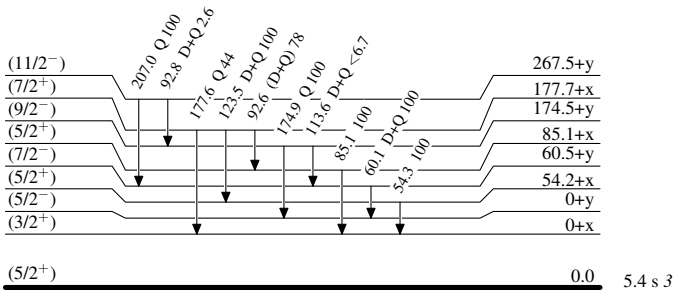
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

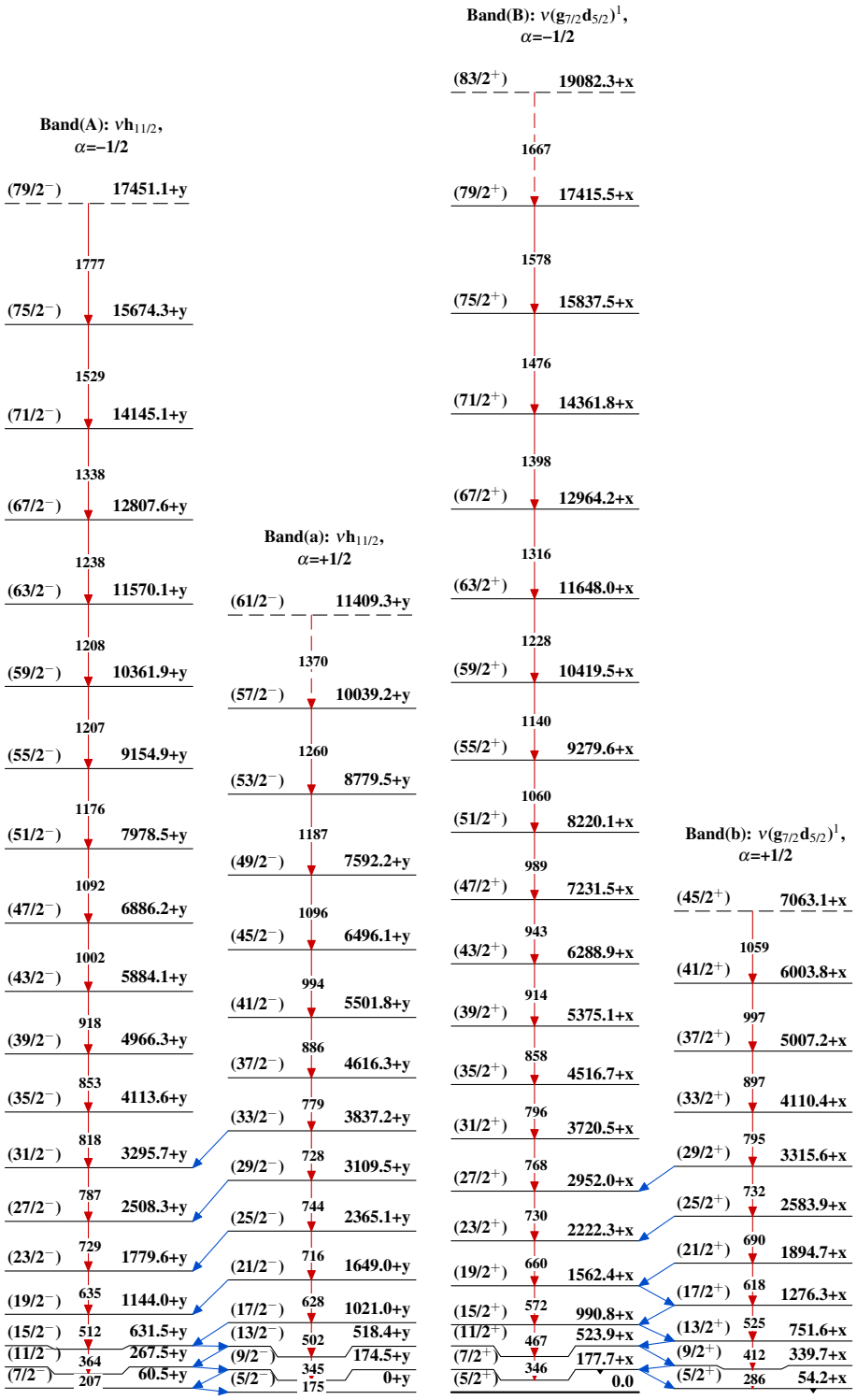
Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{119}_{56}Ba_{63}$

Adopted Levels, Gammas



$^{119}_{56}Ba_{63}$