^{70}Zn(^{11}B,3nγ) 1996La13

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Ameenah R. Farhan, Balraj Singh	NDS 110, 1917 (2009)	30-Jun-2009

1996La13: E= 45 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO) using an array of nine Compton-suppressed Ge detectors and a multiplicity filter of 28 BGO detectors. Comparisons with cranked-shell model calculations.

^{78}Br Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]
0.0	1$^+$		828.4 *7*	(8$^-$)	3016.6[a] *8*	(12$^-$)
32.3 *3*	2$^-$		977.9[&] *7*	9$^+$	3149.8[&] *8*	(13$^+$)
180.9 *5*	4$^+$	119.4[#] μs *10*	1030.3[a] *6*	(8$^-$)	3620.0[b] *8*	(13$^-$)
227.7 *6*	5$^{(+)}$		1372.7[@] *7*	10$^+$	4050.2[@] *13*	(14$^+$)
338.0 *6*	6$^+$		1463.2[b] *6*	(9$^-$)	4296.6[a] *13*	(14$^-$)
423.5[a] *6*	(6$^-$)		1905.1[a] *7*	(10$^-$)	4542.8[&] *13*	(15$^+$)
438.0 *6*	7$^+$		1941.5[&] *8*	11$^+$	4922.0[b] *13*	(15$^-$)
468.1[@] *7*	8$^+$		2455.6[b] *7*	(11$^-$)	5605.2[@] *16*	(16$^+$)
685.0[b] *6*	(7$^-$)		2586.2[@] *8*	(12$^+$)	6087.8[&] *16*	(17$^+$)

[†] From least-squares fit to Eγ's, assuming Δ(Eγ)=0.3 keV when Eγ stated to nearest keV and 1 keV otherwise.
[‡] As proposed by 1996La13 based on band associations and DCO values for selected transitions. The assignments are the same in 'Adopted Levels', except that all are given in parentheses for excited states due to lack of strong supporting arguments.
[#] from 'Adopted Levels'.
[@] Band(A): Band based on 8$^+$, α=0.
[&] Band(a): Band based on 9$^+$, α=1.
[a] Band(B): Band based on (6$^-$), α=0.
[b] Band(b): Band based on (7$^-$), α=1.

γ(^{78}Br)

DCO values correspond to angles of 35° (or 145°) and 90° with gate on ΔJ=2, quadrupole transition. Expected values are 1.0 for ΔJ=2, quadrupole, 0.5 for ΔJ=1, dipole and 0 to 2 for ΔJ=1, dipole+quadrupole transitions.

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[†]	Comments
30.1		468.1	8$^+$	438.0	7$^+$		E$_\gamma$: from level-energy difference. Eγ=32.1 shown in figure 3 of 1996La13.
32.3		32.3	2$^-$	0.0	1$^+$		
46.8		227.7	5$^{(+)}$	180.9	4$^+$		
100.0	100 *8*	438.0	7$^+$	338.0	6$^+$	D	DCO=0.51 *9*
110.3	123 *9*	338.0	6$^+$	227.7	5$^{(+)}$	D	DCO=0.31 *6*
148.6[‡]		180.9	4$^+$	32.3	2$^-$		
195.8	36 *5*	423.5	(6$^-$)	227.7	5$^{(+)}$		E$_\gamma$: probable multiplet, partly deexcites a level at 196 keV; also contributed by a 195γ from ^{74}Br.
261.5	16 *3*	685.0	(7$^-$)	423.5	(6$^-$)		
345.3	7 *1*	1030.3	(8$^-$)	685.0	(7$^-$)		
347.0	11 *2*	685.0	(7$^-$)	338.0	6$^+$		
394.8	21 *3*	1372.7	10$^+$	977.9	9$^+$		
404.9	16 *1*	828.4	(8$^-$)	423.5	(6$^-$)		
432.9	13 *2*	1463.2	(9$^-$)	1030.3	(8$^-$)		

Continued on next page (footnotes at end of table)

^{70}Zn(^{11}B,3nγ) 1996La13 (continued)

γ(^{78}Br) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
457.3	22 *4*	685.0	(7^-)	227.7	$5^{(+)}$		
509.8	86 *13*	977.9	9^+	468.1	8^+		
563.6	19 *3*	3149.8	(13^+)	2586.2	(12^+)	(D)	DCO=0.7 *3*
568.8	43 *6*	1941.5	11^+	1372.7	10^+	D	DCO=0.54 *18*
592.3	5 *1*	1030.3	(8^-)	438.0	7^+		
606.8	38 *3*	1030.3	(8^-)	423.5	(6^-)		
778.2	29 *5*	1463.2	(9^-)	685.0	(7^-)		
874.8	30 *7*	1905.1	(10^-)	1030.3	(8^-)		
904.6	110 *16*	1372.7	10^+	468.1	8^+		
963.6	5 *1*	1941.5	11^+	977.9	9^+		
992.4	15 *5*	2455.6	(11^-)	1463.2	(9^-)		
1111.5	25 *5*	3016.6	(12^-)	1905.1	(10^-)		E_γ: from figure 3 of 1996La13, 1111 in authors′ table I.
1164.4	18 *3*	3620.0	(13^-)	2455.6	(11^-)		E_γ: from figure 3 of 1996La13, 1164 in authors′ table I.
1208.3	18 *3*	3149.8	(13^+)	1941.5	11^+	(Q)	DCO=0.95 *31*
1213.5	41 *6*	2586.2	(12^+)	1372.7	10^+	(Q)	DCO=0.8 *3*
1280	14 *2*	4296.6	(14^-)	3016.6	(12^-)		
1302	16 *3*	4922.0	(15^-)	3620.0	(13^-)		
1393	8 *1*	4542.8	(15^+)	3149.8	(13^+)		
1464	16 *3*	4050.2	(14^+)	2586.2	(12^+)		
1545	7 *1*	6087.8	(17^+)	4542.8	(15^+)		
1555	8 *1*	5605.2	(16^+)	4050.2	(14^+)		

[†] $\Delta J=1$, dipole or $\Delta J=2$, quadrupole from DCO values.
[‡] Placement of transition in the level scheme is uncertain.

^{70}Zn(^{11}B,3nγ) 1996La13

Level Scheme

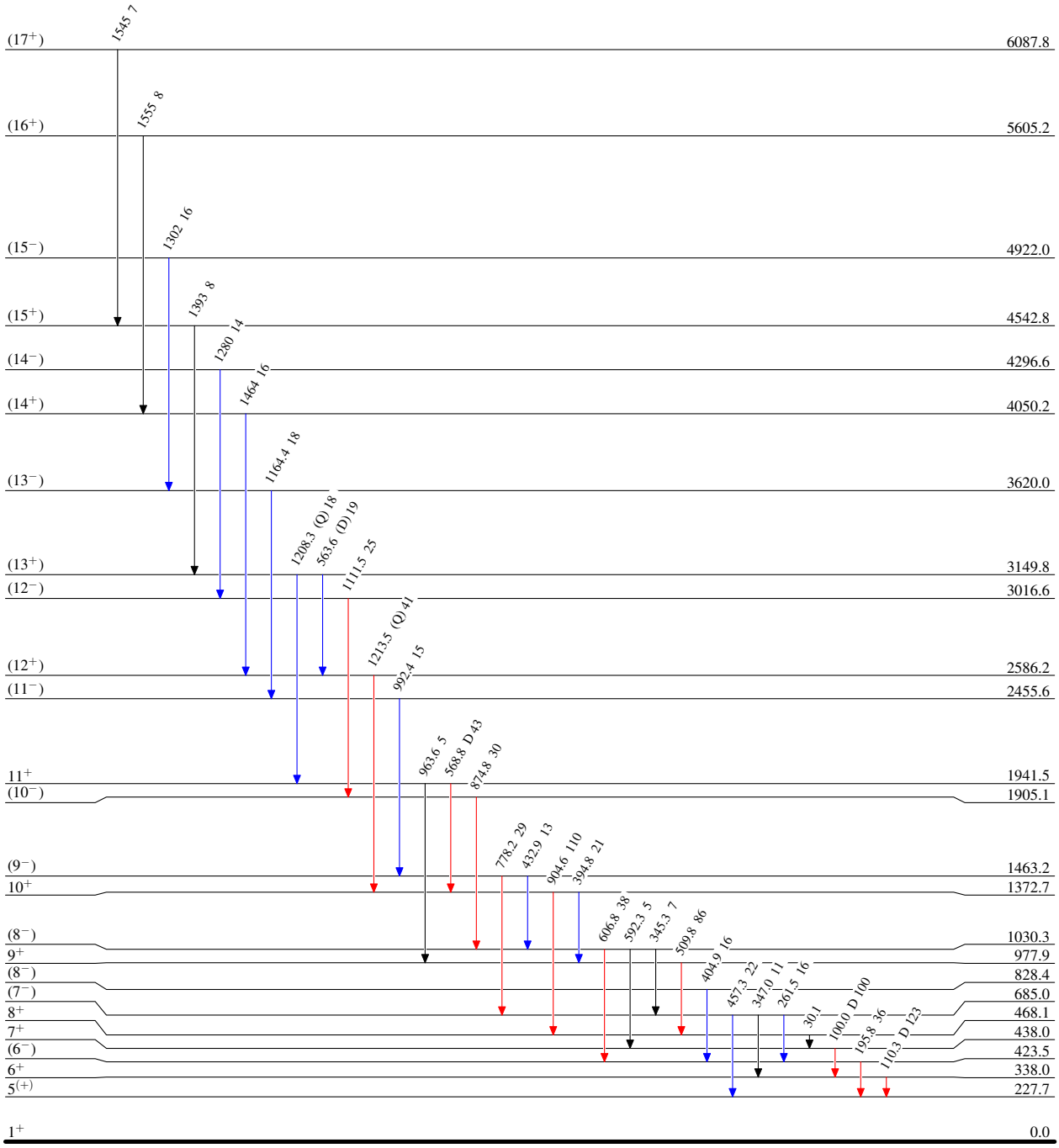
Intensities: Relative I_γ

Legend

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

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

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



$^{78}_{35}Br_{43}$

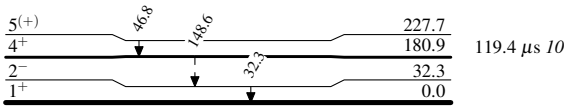
^{70}Zn(^{11}B,3nγ) 1996La13

Legend

Level Scheme (continued)

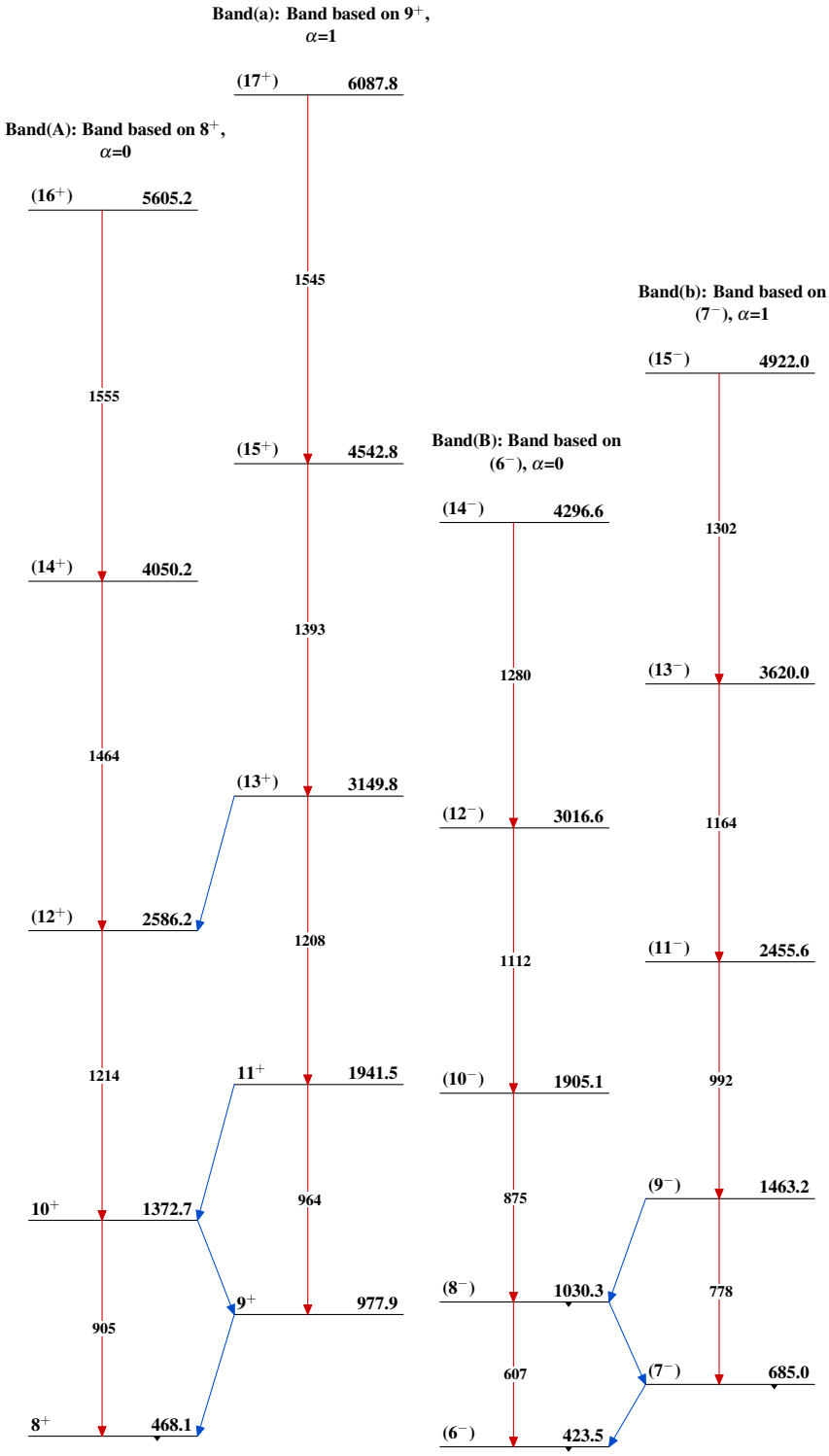
Intensities: Relative I_γ

γ Decay (Uncertain)



$^{78}_{35}Br_{43}$

^{70}Zn(^{11}B,3nγ) 1996La13



$^{78}_{35}Br_{43}$