^{81}Br(n,n′γ) 1971Ba78

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 199,271 (2025)	1-Sep-2024

E=400 keV to 1900 keV. 49.5% ^{81}Br target; measured Eγ, Iγ.

Level scheme constructed by authors of 1971Ba78 based on γ energy and summing, aided by knowledge of level energies from β^- decay (1969Zo06) and Coulomb excitation.

^{81}Br Levels

E(level)†	E(level)†	E(level)†	E(level)†
0	767.3 *10*	1237 *2*	1543 *2*
276.4 *10*	828.9 *10*	1266# *2*	1587 *2*
536.9 *10*	836.7 *10*	1323 *2*	1670 *2*
538.2 *10*	1023.9 *20*	1350 *2*	
566.4 *10*	1076?‡ *2*	1401?‡ *2*	
650.1 *10*	1105?‡ *2*	1536 *2*	

† From 1971Ba78; ΔE<1 keV for E<1000, <2 keV otherwise noted authors in the text. ΔEγ not listed by authors.

‡ Level should be considered as tentative because the transitions involved are weak or can also be placed elsewhere in ^{79}Br or ^{81}Br level schemes.

Deexcitation of this 1266 level differs significantly from that reported in (α,p2nγ) for a $(9/2)^-$ level at the same energy. The 430γ is present in both reactions, but the 500γ and 1266γ are absent in (α,p2nγ), whereas the strongest branch in (α,p2nγ) (Eγ=990.4) does not appear in the level scheme of 1971Ba78. The unplaced 992γ could perhaps correspond to the 990γ of (α,p2nγ) and the multiply placed 1266γ may be misplaced here, but the absence in (α,p2nγ) of the 500γ and the level it feeds strongly suggests that different levels are excited in these two reactions.

γ(^{81}Br)

E_i(level)	E_γ†	I_γ&	E_f	Comments
276.4	276.4	100	0	
536.9	260.5‡[a]	100	276.4	
538.2	538.2	100	0	Additional placement possible.
566.4	290.3	69 *7*	276.4	I_γ: includes contribution to Eγ=290 doublet from 829 to 538 transition.
	566.2	31 *3*	0	Additional placement possible; undivided intensity given.
650.1	650.1	100	0	
767.3	491.3	13.0 *13*	276.4	
	766.9	87 *9*	0	
828.9	290.3[a]		538.2	I_γ,E_γ: not resolved from 566 to 276 transition; Iγ≤4 expected based on adopted I(290γ)/I(829γ).
	552.7	25 *3*	276.4	
	828.7	75 *8*	0	Additional placement possible; undivided intensity given.
836.7	560.1	71 *7*	276.4	
	836.9	29 *3*	0	
1023.9	486.8	15 *4*	538.2	
	747.5	78 *20*	276.4	
	1023.9	7 *2*	0	
1076?	538.2[a]		538.2	Multiply-placed transition.
	1076.0[a]		0	Strong line, but could be a ^{79}Br γ.
1105?	566.2[a]		538.2	I(566γ) observed to increase for E(n)≥1200, supporting multiple placement for this γ.
	828.7[a]		276.4	Multiply-placed transition.
	1105.0[a]		0	Strong line, but could be a ^{79}Br γ.
1237	962.0	50 *13*	276.4	
	1236.7	50 *13*	0	

Continued on next page (footnotes at end of table)

^{81}Br(n,n′γ) 1971Ba78 (continued)

γ(^{81}Br) (continued)

E_i(level)	E_γ[†]	I_γ[&]	E_f	Comments
1266	430.6	40 *10*	836.7	
	500.0	40 *10*	767.3	
	1266.1	20 *5*	0	Additional placement possible; undivided intensity given.
1323	486.4	11 *3*	836.7	
	1047.1	74 *19*	276.4	
	1322.8	15 *4*	0	
1350	326.7	53 *13*	1023.9	
	583.1	29 *7*	767.3	
	1350.0	18 *5*	0	
1401?	572.6[a]	46 *12*	828.9	
	1400.7[a]	54 *14*	0	
1536	458.5[a]		1076?	
	886.0	37 *9*	650.1	
	997.7	14 *4*	538.2	
	1260.1	19 *5*	276.4	
	1536.0	30 *8*	0	
1543	715.4	85 *21*	828.9	
	775.0	9 *2*	767.3	
	1266.1[a]		276.4	Multiply-placed transition.
	1543.2	6 *2*	0	
1587	1311.5	29 *7*	276.4	
	1587.2	71 *18*	0	
1670	1393.7	19 *5*	276.4	
	1669.9	81 *20*	0	

[†] ΔE not stated by authors in 1971Ba78.
[‡] Presence in this reaction is uncertain due to interference from a relatively intense ^{79}Br line.
[#] Iγ normalized so that I(276.4γ)=100 for E(n)=1900 keV. Uncertain whether γ is due to ^{81}Br or ^{79}Br.
[@] In (p,γ) reaction, a 789.6γ is assigned to deexcite a 1327 keV level; however, this 789.9γ must have a different origin because 1971Ba78 observe it for E(n)≥900.
[&] % photon branching from each level measured at 85°. Authors assume that corrections for angular correlation effects or internal conversion will be small, so do not include them. Quoted uncertainty is 10% for Eγ<1000, 25% for Eγ≥1000; it is not clear whether this is absolute or fractional uncertainty in branching (the latter has been assumed here). If branching is not shown, transition is either very weak or unresolved from another line.
[a] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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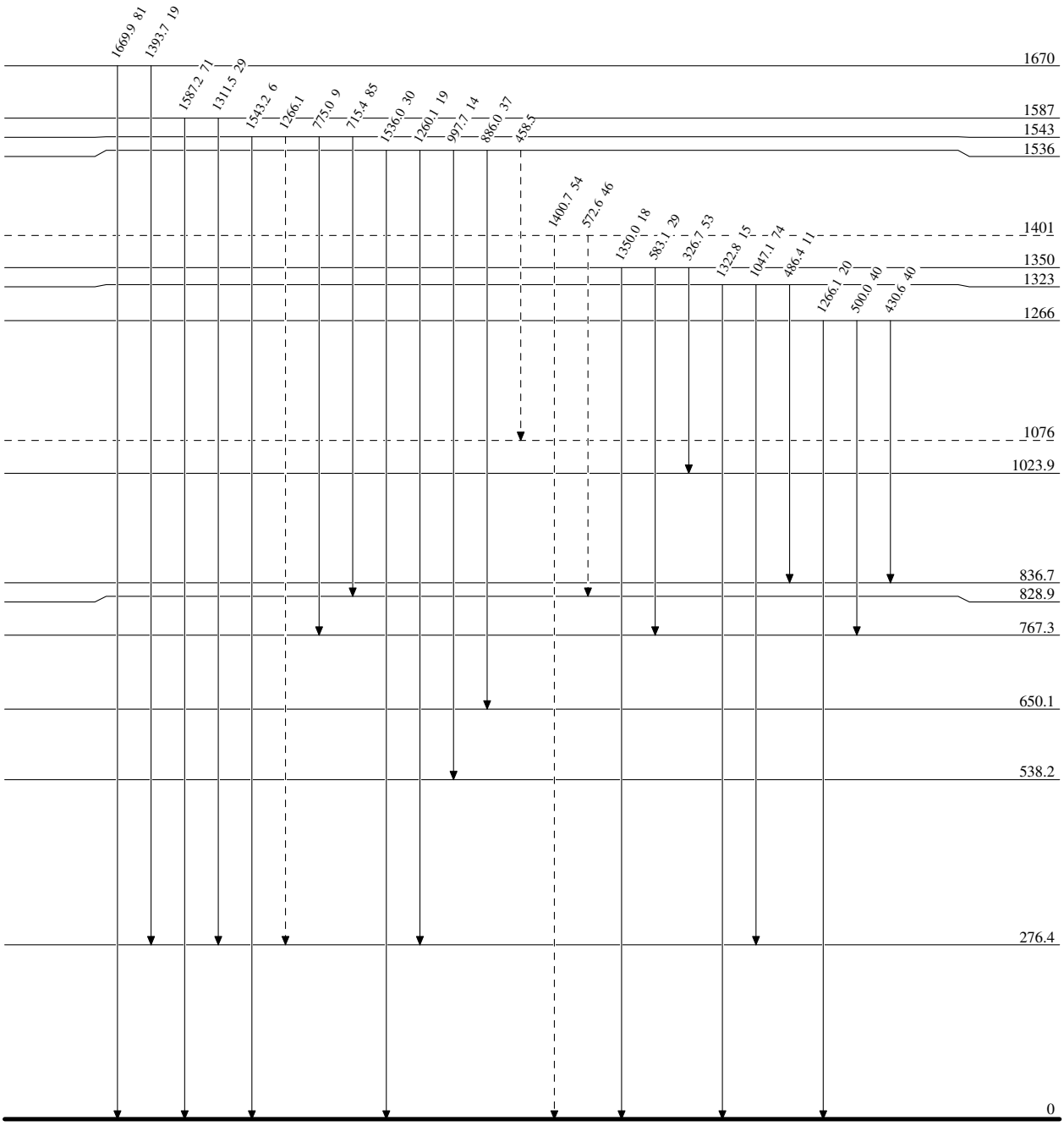
Legend

Level Scheme

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{81}_{35}Br_{46}$

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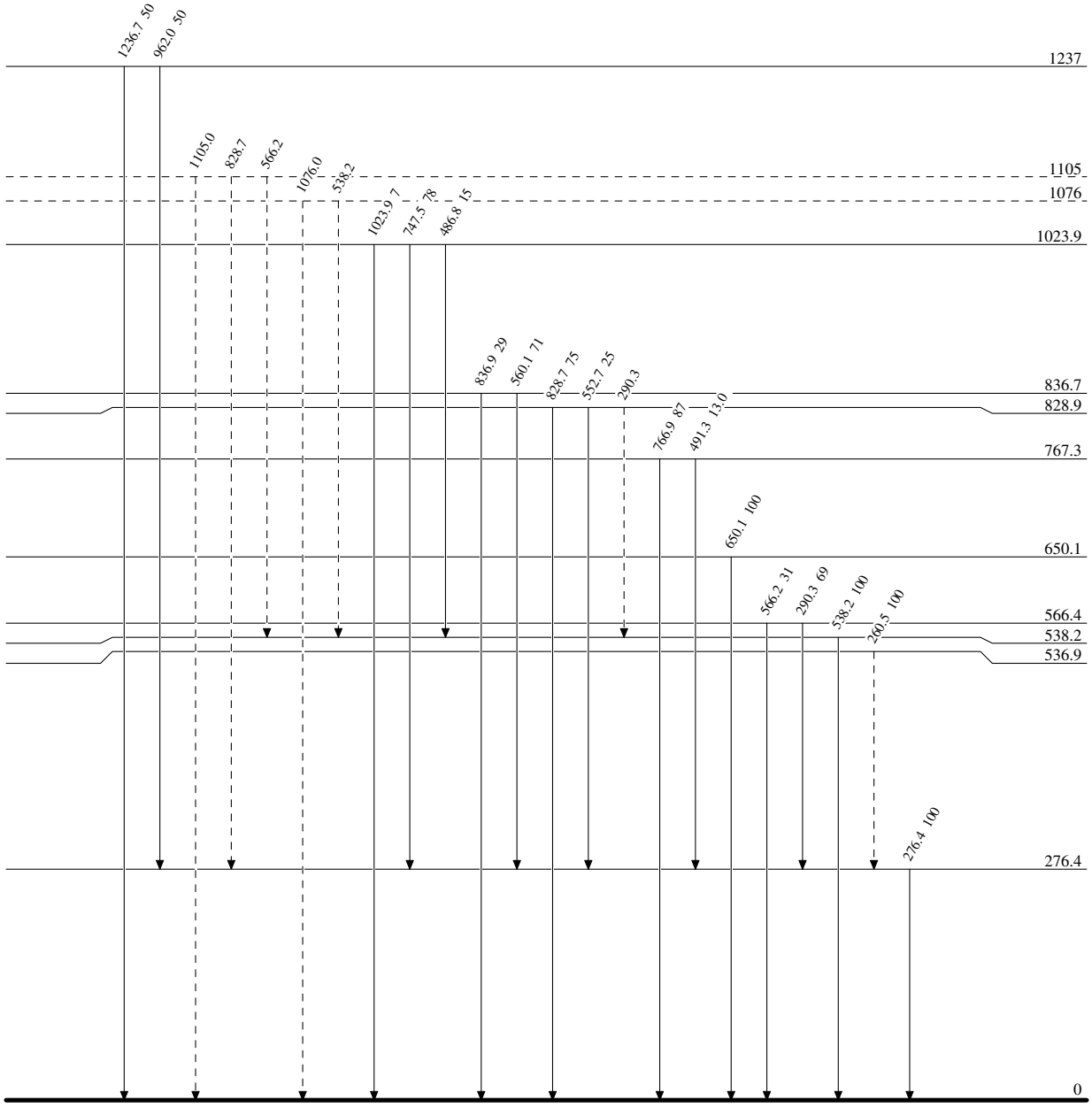
Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{81}_{35}Br_{46}$