$^{113}In(\alpha,2n\gamma)$ 1977Br08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 113, 2391 (2012)	1-Sep-2012

$^{113}In(\alpha,2n\gamma)$ E=20-30 MeV (1977Br08), 27 MeV (1973FrYL,1975HeZF,1980Le05), 27.3 MeV (1995LoZZ,1998Lo11).
$^{116}Sn(p,2n\gamma)$ E=14-28 MeV (1976Ka25) Iγ at E=20 MeV quoted by 1977Br08.
$^{115}Sn(p,n\gamma)$ E=5.5, 5.9 MeV (1995Bu15), measured $T_{1/2}$, DSAM.
$^{112}Cd(^{6}Li,3n\gamma)$ E=24-34 MeV (1979Sh03) Iγ at E=34 MeV stated.
$^{100}Mo(^{19}F,4n)$ E=16 MeV.
Measured Eγ, Iγ, Ag(t), $\gamma\gamma$(t), $\gamma(\theta)$, I(ce), excit (1977Br08) semi.
γ(t) (1980Le05), $\gamma(\theta$,H,t) (1983Se04).

^{115}Sb Levels

E(level)‡	J^{π}†	$T_{1/2}$	Comments
0.0	5/2+	32.1 min *3*	$T_{1/2}$: from Adopted Levels.
723.6	7/2+		
770.4		0.44 ps *+37−15*	$T_{1/2}$: from 1995Bu15.
1071.7		0.093 ps *+21−14*	$T_{1/2}$: from 1995Bu15.
1098.6	7/2+	0.58 ps *8*	$T_{1/2}$: from 1998Lo11.
1300.2	11/2−	6.2 ns	$T_{1/2}$: from 1977Br08. Branching: Iγ(557γ)/Iγ(1300γ)=0.085 *4* (1977Br08), 0.09 *2* (1976Ka25).
1326.8	9/2+	1.21 ps *+24−14*	$T_{1/2}$: from 1998Lo11; other:<5 ps (1977Br08). Branching: Iγ(603γ)/Iγ(1327γ)=0.49 *10* (1977Br08), 0.39 *4* (1976Ka25), 0.43 *6* (1979Sh03); lower Iγ-ratios observed via decay studies.
1380.5#	9/2+	0.97 ps *28*	$T_{1/2}$: from 1998Lo11, other:<5 ps (1977Br08). Branching: Iγ(657γ)/Iγ(1380γ)=0.305 *16* (1977Br08), 0.39 *4* (1976Ka25), 0.43 *6* (1979Sh03).
1504.2		0.106 ps *6*	$T_{1/2}$: from 1995Bu15.
1736.3	(5/2+)		
1754.9#	11/2+		Branching: Iγ(428γ)/Iγ(374γ)=0.38 *2* (1977Br08), 0.35 *13* (1976Ka25), 0.32 *5* (1979Sh03).
1937.2		0.90 ps *+35−14*	$T_{1/2}$: from 1998Lo11.
2092.4#	13/2+		Branching: Iγ(712γ)/Iγ(337γ)=0.15 *3* (1977Br08), 0.19 *4* (1979Sh03).
2315.9	13/2−		
2457.6#	15/2+		Branching: Iγ(703γ)/Iγ(365γ)=0.25 *3* (1977Br08), 0.23 *6* (1979Sh03).
2516.9	15/2−	0.42 ps *+21−14*	$T_{1/2}$: from 1998Lo11.
2638.3	15/2−		
2796.2	19/2−	159 ns *3*	$T_{1/2}$: from 1979Sh03.
2803.4	(17/2)−		
2838.4#	17/2+		Branching: Iγ(746γ)/Iγ(381γ)=0.32 *9* (1977Br08), 0.34 *9* (1979Sh03).
2960.7	(19/2)−		
3003.6	21/2−		
3098	(19/2)		E(level): seen by 1979Sh03 in (^{6}Li,3nγ).
3255.6#	19/2+	1.1 ps *+10−5*	$T_{1/2}$: from 1998Lo11. Branching: Iγ(798γ)/Iγ(417γ)=0.46 *12* (1977Br08), 0.48 *16* (1979Sh03).
3445.5	23/2−		
3542.5	(23/2)−		
3659.7	25/2+	4.1 ns *2*	$T_{1/2}$: 4.1 ns *2* unweighted av: 4.17 ns *14* (1973FrYL), 4.0 ns *2* (1977Br08) (207γ,214γ)(t). Iγ(207γ)(214γ)(442γ)-coin (prompt vs delayed) measured by 1973FrYL establishes ordering of γ-cascade from 4-ns initial state.
3692.8#	21/2+		Branching: Iγ(854γ)/Iγ(437γ)=0.39 *6* (1977Br08), 0.38 *13* (1979Sh03).

Continued on next page (footnotes at end of table)

^{113}In(α,2nγ) 1977Br08 (continued)

^{115}Sb Levels (continued)

† From Adopted Levels.
‡ E(levels)=3544.2, 3791.5, 4283.0 proposed by 1977Br08 but not seen by 1976Sh03 are now given in (HI,xnγ).
# Band(A): 9/2(404) band; rotational interpretation of ΔJ=1 sequence is consistent with level spacings, δ of ΔJ=1 transitions, intraband-branching ratios, and Nilsson model predictions; see 1979Sh03, 1977Br08, 1976He16.

γ(^{115}Sb)

α(K)exp=ce(K)/Iγ (1977Br08) magnetic spectrometer, semi detectors.

E_γ	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ#	α@	Comments
157.82 *7*	13.5 *15*	2796.2	19/2⁻	2638.3	15/2⁻	E2		0.33	α(K)exp=0.29 *10*; α(L)exp=0.078 *18*
207.41 *7*	35 *3*	3003.6	21/2⁻	2796.2	19/2⁻	M1+E2	−0.21 *6*	0.085 *1*	α(K)exp=0.076 *17*; α(L)exp=0.009 *2* E_γ: others: 207.37 *6* (1973FrYL), 207.5 (1975HeZF). δ: −0.21 *6* (1977Br08). Other: −0.08 *6* (1979Sh03).
214.18 *7*	15.9 *11*	3659.7	25/2⁺	3445.5	23/2⁻	E1		0.022	α(K)exp=0.026 *6* E_γ: others: 214.16 *8* (1973FrYL), 214.3 (1975HeZF).
ˣ247.3 *2*	4.3 *3*								α(K)exp=0.034 *8* A_2=0.10 *11* (1977Br08).
279.40 *14*	40.0 *15*	2796.2	19/2⁻	2516.9	15/2⁻	E2		0.0468	α(K)exp=0.038 *6*; α(L)exp=0.0062 *10*
322.34 *14*	4.7 *4*	2638.3	15/2⁻	2315.9	13/2⁻	M1+E2	−0.14 *9*	0.0262 *1*	α(K)exp=0.017 *4* δ: −0.14 *9* (1977Br08) A_2=−0.23 *6*.
337.56 *9*	25.4 *9*	2092.4	13/2⁺	1754.9	11/2⁺	M1+E2	+0.156 *11*	0.02325 *1*	α(K)exp=0.021 *4* δ: +0.156 *11* (1977Br08), +0.17 *5* (1979Sh03).
345.8 *2*	3.8 *5*	2803.4	(17/2)⁻	2457.6	15/2⁺	E1			α(K)exp=0.0075 *19*
365.1 *2*	21.8 *7*	2457.6	15/2⁺	2092.4	13/2⁺	M1+E2	+0.181 *6*	0.01904 *1*	α(K)exp=0.015 *3* δ: +0.181 *6* (1977Br08), +0.15 *4* (1979Sh03).
374.47 *14*	27.5 *9*	1754.9	11/2⁺	1380.5	9/2⁺	M1+E2	+0.24 *2*	0.01783 *1*	α(K)exp=0.016 *3* δ: +0.24 *2* (1977Br08), +0.21 *4* (1979Sh03).
380.83 *9*	14.0 *3*	2838.4	17/2⁺	2457.6	15/2⁺	M1+E2	+0.166 *13*	0.01711 *1*	α(K)exp=0.014 *3* δ: +0.166 *13* (1977Br08), +0.14 *5* (1979Sh03).
417.2 *2*	8.7 *3*	3255.6	19/2⁺	2838.4	17/2⁺	M1+E2	+0.116 *6*	0.01360 *1*	α(K)exp=0.0083 *18* δ: +0.116 *6* (1977Br08), +0.18 *6* (1979Sh03).
427.99 *10*	10.5 *4*	1754.9	11/2⁺	1326.8	9/2⁺	M1+E2	+0.28 *7*	0.01272 *2*	α(K)exp=0.012 *3* δ: +0.28 *7* (1977Br08), +0.28 *6* (1979Sh03).
437.20 *8*	4.9 *2*	3692.8	21/2⁺	3255.6	19/2⁺	M1+E2	+0.12 *3*		α(K)exp=0.0084 *18* δ: +0.12 *3* (1977Br08), +0.13 *5* (1979Sh03).
441.87 *8*	18.3 *4*	3445.5	23/2⁻	3003.6	21/2⁻	M1+E2	−0.28 *6*		α(K)exp=0.010 *2* E_γ: others: 441.82 *10*

Continued on next page (footnotes at end of table)

^{113}In(α,2nγ) 1977Br08 (continued)

γ(^{115}Sb) (continued)

E_γ	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	δ[#]	α[@]	Comments
									(1973FrYL), 442.0 (1975HeZF). δ: −0.28 *6* (1979Sh03), −2<δ<−0.4 (1977Br08).
443.75 *8*	13.7 *5*	2960.7	(19/2)$^-$	2516.9	15/2$^-$	E2		0.011	α(K)exp=0.0077 *18* Mult.: from A_2=0.25 *5* (1977Br08), 0.36 *4* (1979Sh03). For alternate placement, see 1979Sh03.
^{x}540.5 *3*	6.0 *5*								α(K)exp=0.0032 *9* A_2=−0.12 *6* (1977Br08).
576.50 *13*	8.5 *4*	1300.2	11/2$^-$	723.6	7/2$^+$	M2		0.019	α(K)exp=0.019 *4*
581.76 *11*	9.0 *4*	3542.5	(23/2)$^-$	2960.7	(19/2)$^-$	E2			α(K)exp=0.0061 *14* Mult.: from A_2=0.31 *3* (1977Br08). For alternate placement, see 1979Sh03.
603.0 *5*	10 *2*	1326.8	9/2$^+$	723.6	7/2$^+$	M1(+E2)	0.05 *8*		δ: pure M1 from α(K)exp=0.0057 *6* (1974Ch51), +0.12 *4* (1977Br08) A_2=−0.04 *3*, −0.05 *8* (1979Sh03) A_2=−0.22 *5*.
^{x}623.3 *2*	3.0 *7*								A_2=−0.67 *18* (1977Br08).
656.89 *9*	9.0 *4*	1380.5	9/2$^+$	723.6	7/2$^+$	M1+E2	−0.07 *4*		α(K)exp=0.0032 *9* δ: −0.07 *4* (1977Br08), −0.07 *7* (1979Sh03).
702.9 *3*	5.4 *7*	2457.6	15/2$^+$	1754.9	11/2$^+$	(E2)			Mult.: from A_2=0.17 *8* (1977Br08).
712.0 *3*	3.8 *6*	2092.4	13/2$^+$	1380.5	9/2$^+$	(E2)			Mult.: from A_2=0.30 *8* (1977Br08).
723.53 *9*	44.4 *13*	723.6	7/2$^+$	0.0	5/2$^+$	M1(+E2)			α(K)exp=0.0030 *6* E_γ: from 1974Ch51. Others: 723.53 *9* (1977Br08), 723.6 *1* (1975WiZX). δ: pure M1 from α(K)exp=0.00342 *20* (1974Ch51), −2<δ<−0.2 from A_2=−0.382 *17* (1977Br08).
745.9 *2*	4.5 *12*	2838.4	17/2$^+$	2092.4	13/2$^+$	(E2)			Mult.: consistent with A_2≈0.2 (1977Br08).
797.9 *2*	4.0 *10*	3255.6	19/2$^+$	2457.6	15/2$^+$	(E2)			Mult.: from A_2=0.23 *11* (1977Br08).
854.15 *15*	1.9 *3*	3692.8	21/2$^+$	2838.4	17/2$^+$	(E2)			Mult.: from A_2=0.43 *17* (1977Br08).
1012.7 *2*	6.0 *15*	1736.3	(5/2$^+$)	723.6	7/2$^+$	(M1+E2)			+0.3<δ<3 from A_2=−0.30 *12* (1977Br08).
1015.64 *15*	11.0 *15*	2315.9	13/2$^-$	1300.2	11/2$^-$	M1+E2	−0.28 *11*		δ: −0.28 *11* from A_2=−0.56 *9* (1977Br08). Doublet α(K)exp=0.0009 *2*.
1098.64 *12*	12.3 *7*	1098.6	7/2$^+$	0.0	5/2$^+$	M1(+E2)			α(K)exp=0.0009 *3* δ: −3<δ<−0.13 (1977Br08) A_2=−0.34 *6*.
1213.57 *14*	6.9 *10*	1937.2		723.6	7/2$^+$				
1216.70 *11*	58.9 *12*	2516.9	15/2$^-$	1300.2	11/2$^-$	E2			α(K)exp=0.0008 *2* Mult.: from A_2=0.29 *5* (1977Br08).
1300.25 *10*	100	1300.2	11/2$^-$	0.0	5/2$^+$	E3			α(K)exp=0.0013 *3*

Continued on next page (footnotes at end of table)

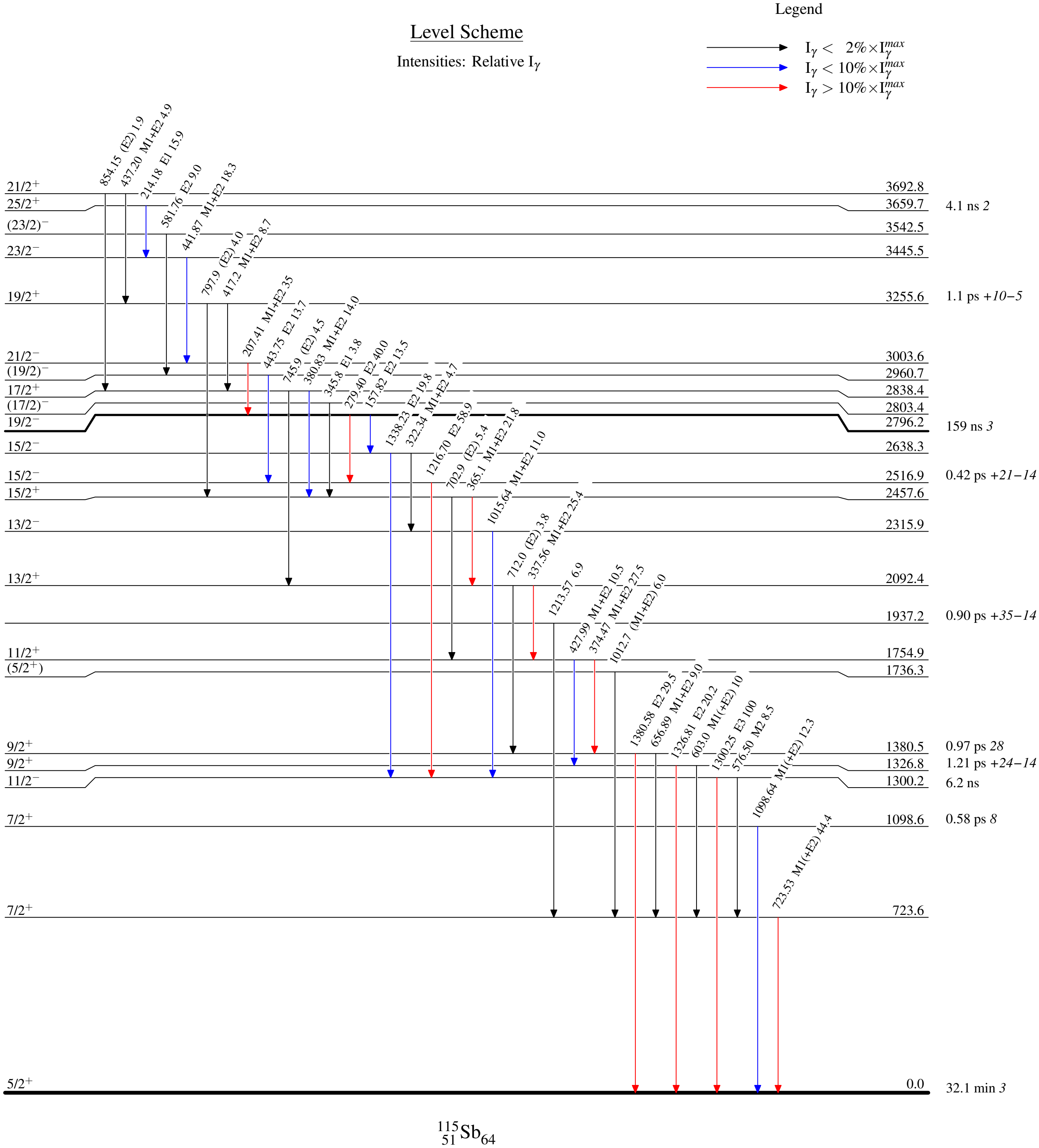
^{113}In(α,2nγ) 1977Br08 (continued)

γ(^{115}Sb) (continued)

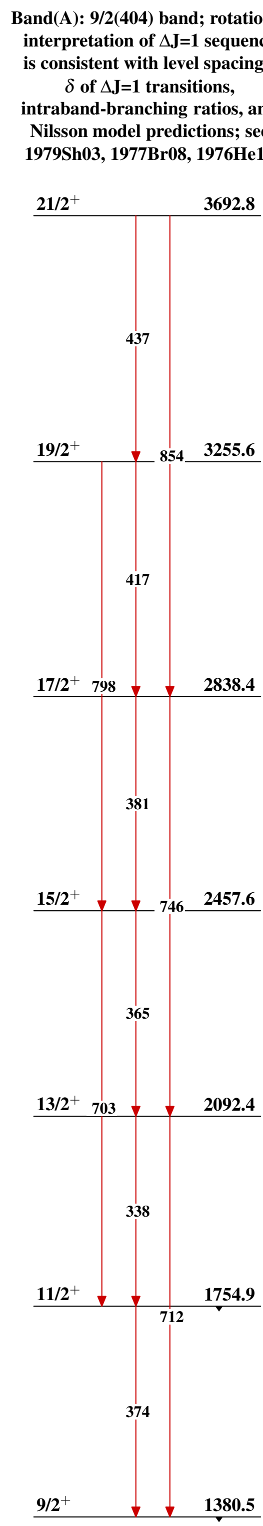
E_γ	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	Comments
1326.81 *12*	20.2 *9*	1326.8	9/2$^+$	0.0	5/2$^+$	E2	α(K)exp=0.00053 *14* Mult.: δ=−0.005 *9*; A_2=0.22 *3* (1977Br08), 0.21 *5* (1979Sh03).
1338.23 *13*	19.8 *9*	2638.3	15/2$^-$	1300.2	11/2$^-$	E2	α(K)exp=0.00062 *16* Mult.: from A_2=0.37 *4* (1977Br08).
1380.58 *15*	29.5 *10*	1380.5	9/2$^+$	0.0	5/2$^+$	E2	α(K)exp=0.00075 *20* Mult.: δ=0.02 *9*; A_2=0.23 *2* (1977Br08), 0.25 *4* (1979Sh03).

† At Eα=27 MeV (1977Br08) corrected for $\gamma(\theta)$ effects.
‡ Deduced from α(K)exp, α(L)exp and $\gamma(\theta)$.
# Deduced from $\gamma(\theta)$, unless otherwise noted.
@ 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.
^{x} γ ray not placed in level scheme.

^{113}In(α,2nγ) 1977Br08



^{113}In(α,2nγ) 1977Br08



$^{115}_{51}Sb_{64}$