Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Alexandru Negret, Balraj Singh	NDS 124, 1 (2015)	30-Nov-2014

Q(β^-)=7633 *3*; S(n)=5128 *4*; S(p)=10508 *4*; Q(α)=−7954 *5* 2012Wa38
S(2n)=13992 *26*, S(2p)=24357 *4* (2012Wa38).

^{86}Br nuclide first produced in decay of ^{86}Se by 1960Sa05 who assigned a 16-s activity incorrectly to ^{87}Se decay, instead of correct assignment of ^{86}Se to ^{86}Br. Confirmed identification is from the work of 1962St13, and several later studies. It is possible that a 50-70 s activity found by 1959Ye08 belonged to ^{86}Br.

A 4.5 s *10* (possible isomeric) activity was assigned to ^{86}Br by 1970Lu06 from the decay pattern of 1564γ in ^{86}Kr, but the existence of this activity remains unconfirmed.

In 2009Po10 from comparison with ^{88}Rb structure authors suggest that level 1624 keV is 10 ns isomer, but this was not confirmed in experiment.

Precise mass measurement using Penning-trap spectrometer: 2007Ra23.

^{86}Br Levels

Cross Reference (XREF) Flags

- A ^{86}Se β^- decay (14.3 s)
- B ^{87}Se β^-n decay (5.50 s)
- C ^{208}Pb(^{18}O,Fγ)

E(level)	J$^\pi$	T$_{1/2}$	XREF	Comments
0	(1$^-$)	55.1 s *4*	A C	%β^-=100 J$^\pi$: log $f^{1u}t$≈9.6 to 0$^+$. Possible configuration=$\pi p_{3/2}\otimes\nu d_{5/2}$ (2009Po10). T$_{1/2}$: weighted average of 55.2 s *5* (1976LuZV), 55.7 s *5* (1974Gr29), and 54.1 s *6* (1972KrYX). Others: 55 s *2* (1975Hu02), 1972Nu03, 59 s *4* (1972Ac01), 54 s *2* (1962St13), 1.0 min (1960Sa05, authors assigned ^{87}Se to ^{87}Br activity incorrectly, half-life of 16 s for parent activity suggests correct assignment as ^{86}Se to ^{86}Br), 50-70 s (1959Ye08).
5.1† *3*	(2$^-$)		A C	E(level): from the differences of the 430.5γ-435.5γ and 1042.0γ-1047.1γ doublets. Another evidence for the existence of this level is the depopulation of the 207.5 level by the 154.2γ-48.3γ cascade. J$^\pi$: γ from 1$^+$. Possible 2$^-$ state of configuration=$\pi f_{5/2}\otimes\nu d_{5/2}$ (2009Po10).
53.3† *3*	(3$^-$)		A C	J$^\pi$: M1 to (2$^-$). Possible 3$^-$ state of configuration=$\pi f_{5/2}\otimes\nu d_{5/2}$. J$^\pi$=3$^-$ is in conflict with log *ft*=6.2 (log $f^{1u}t$=8.1) from 0$^+$ in β^- decay, but the β feeding in this decay to the 53-keV level is only an apparent value due to possible unobserved γ transitions feeding this level from higher-energy levels.
130.5 *4*	(4$^-$)		C	J$^\pi$: M1(+E2) γ to (3$^-$). Possible 4$^-$ state of configuration=$\pi p_{3/2}\otimes\nu d_{5/2}$ (2009Po10).
207.39 *24*	(1$^-$,2$^-$)		A	J$^\pi$: log *ft*=7.0 (log $f^{1u}t$=8.7) from 0$^+$; γ to (3$^-$).
243.6† *4*	(4$^-$)		C	J$^\pi$: (M1) γ to (3$^-$). Possible 4$^-$ state of configuration=$\pi f_{5/2}\otimes\nu d_{5/2}$.
298.2 *4*	(0$^-$ to 4$^-$)		A	J$^\pi$: γ to (2$^-$).
435.65 *25*	(1$^-$,2)		A	J$^\pi$: γ rays to (1$^-$) and (3$^-$); γ from 1$^+$.
574.7† *4*	(5$^-$)		C	J$^\pi$: γ rays to (4$^-$). Possible configuration=$\pi f_{5/2}\otimes\nu d_{5/2}$.
1047.2 *3*	(1$^-$,2)		A	J$^\pi$: γ rays to (1$^-$) and (3$^-$); γ from 1$^+$.
1170.4 *4*	(1$^-$,2$^-$)		A	J$^\pi$: log *ft*=6.9 (log $f^{1u}t$=8.6) from 0$^+$; γ to (3$^-$).
1494.2 *5*			C	
1624.3 *4*	(7$^+$)		C	J$^\pi$: possible configuration=$\pi g_{9/2}\otimes\nu d_{5/2}$ (2009Po10).
1779.7 *7*			C	
1920.2 *7*			C	
2446.3 *3*	1$^+$		A	J$^\pi$: log *ft*=4.2 from 0$^+$.
2665.1 *4*	1$^+$		A	E(level): the level may be at 2660, if 2660γ feeds g.s..

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Adopted Levels, Gammas (continued)

^{86}Br Levels (continued)

E(level)	XREF	Comments
		J^π: log *ft*=4.6 from 0^+.
2687.4 *5*	C	
3073.9 *8*	C	
3240.5 *6*	C	
3763.3 *7*	C	
3814.0 *6*	C	

† Band(A): $\pi f^{-1}_{5/2}\otimes\nu d^{+1}_{5/2}$ sequence.

$\gamma(^{86}Br)$

E_i(level)	J^π_i	E_γ	I_γ	E_f	J^π_f	Mult.	δ	α†	Comments
5.1	(2^-)	(5.1)	100	0	(1^-)				E_γ: from level-energy difference.
53.3	(3^-)	48.3 *3*	100	5.1	(2^-)	M1		0.889 *21*	α(K)=0.785 *18*; α(L)=0.0884 *21*; α(M)=0.0141 *4*; α(N+..)=0.00130 *3* α(N)=0.00130 *3* Mult.: from α(exp) (2009Po10).
130.5	(4^-)	77.0 *5*	100	53.3	(3^-)	M1(+E2)	<0.3	0.32 *9*	α(K)=0.28 *8*; α(L)=0.035 *13*; α(M)=0.0056 *20*; α(N+..)=0.00050 *16* α(N)=0.00050 *16* Mult.: from α(exp) (2009Po10); δ deduced by the evaluators.
207.39	(1^-,2^-)	154.2 *4*	39 *2*	53.3	(3^-)				
		207.5 *3*	100 *5*	0	(1^-)				
243.6	(4^-)	190.3 *2*	100	53.3	(3^-)	(M1)		0.0206	α(K)=0.0183 *3*; α(L)=0.00199 *3*; α(M)=0.000316 *5*; α(N+..)=2.95×10^{-5} *5* α(N)=2.95×10^{-5} *5* Mult.: from Adopted ΔJ^π and systematics of transitions in neighboring nuclides.
298.2	(0^- to 4^-)	293.2 *4*	100	5.1	(2^-)				
435.65	(1^-,2)	228.4 *4*	22 *1*	207.39	(1^-,2^-)				
		382.4 *3*	100 *5*	53.3	(3^-)				
		430.5 *4*	13 *1*	5.1	(2^-)				
		435.5 *4*	10 *1*	0	(1^-)				
574.7	(5^-)	331.1 *2*	100 *8*	243.6	(4^-)				
		444.3 *3*	25 *4*	130.5	(4^-)				
1047.2	(1^-,2)	611.6 *5*	9	435.65	(1^-,2)				
		749.0 *4*	32 *1*	298.2	(0^- to 4^-)				
		839.6 *5*	9	207.39	(1^-,2^-)				
		993.8 *4*	100 *5*	53.3	(3^-)				
		1042.0 *4*	23 *1*	5.1	(2^-)				
		1047.1 *5*	10	0	(1^-)				
1170.4	(1^-,2^-)	1117.0 *4*	100	53.3	(3^-)				
1494.2		919.5 *4*	33 *17*	574.7	(5^-)				
		1250.8 *5*	100 *33*	243.6	(4^-)				

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Adopted Levels, Gammas (continued)

$\gamma(^{86}Br)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	Comments
1624.3	(7^+)	130.4 *5*	10 *4*	1494.2			
		1049.6 *2*	100 *10*	574.7	(5^-)		
		1493.5 *5*	16 *8*	130.5	(4^-)	[E3]	
1779.7		1205.0 *5*	100	574.7	(5^-)		
1920.2		1345.5 *5*	100	574.7	(5^-)		
2446.3	1^+	1275.8 *4*	5.1 *3*	1170.4	$(1^-,2^-)$		
		1399.0 *3*	13.3 *7*	1047.2	$(1^-,2)$		
		2010.6 *3*	23.7 *12*	435.65	$(1^-,2)$		
		2239.0 *3*	17.9 *9*	207.39	$(1^-,2^-)$		
		2441.1 *3*	100 *5*	5.1	(2^-)		
2665.1	1^+	2660.0‡ *3*	100	5.1	(2^-)		placement of this transition to the 5.1 level is arbitrary.
2687.4		1063.1 *3*	100	1624.3	(7^+)		
3073.9		1153.7 *5*	100	1920.2			
3240.5		1616.1 *5*	100	1624.3	(7^+)		
3763.3		522.8 *3*	100	3240.5			
3814.0		573.5 *4*	40 *20*	3240.5			
		1126.7 *5*	100 *40*	2687.4			

† 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.

‡ Placement of transition in the level scheme is uncertain.

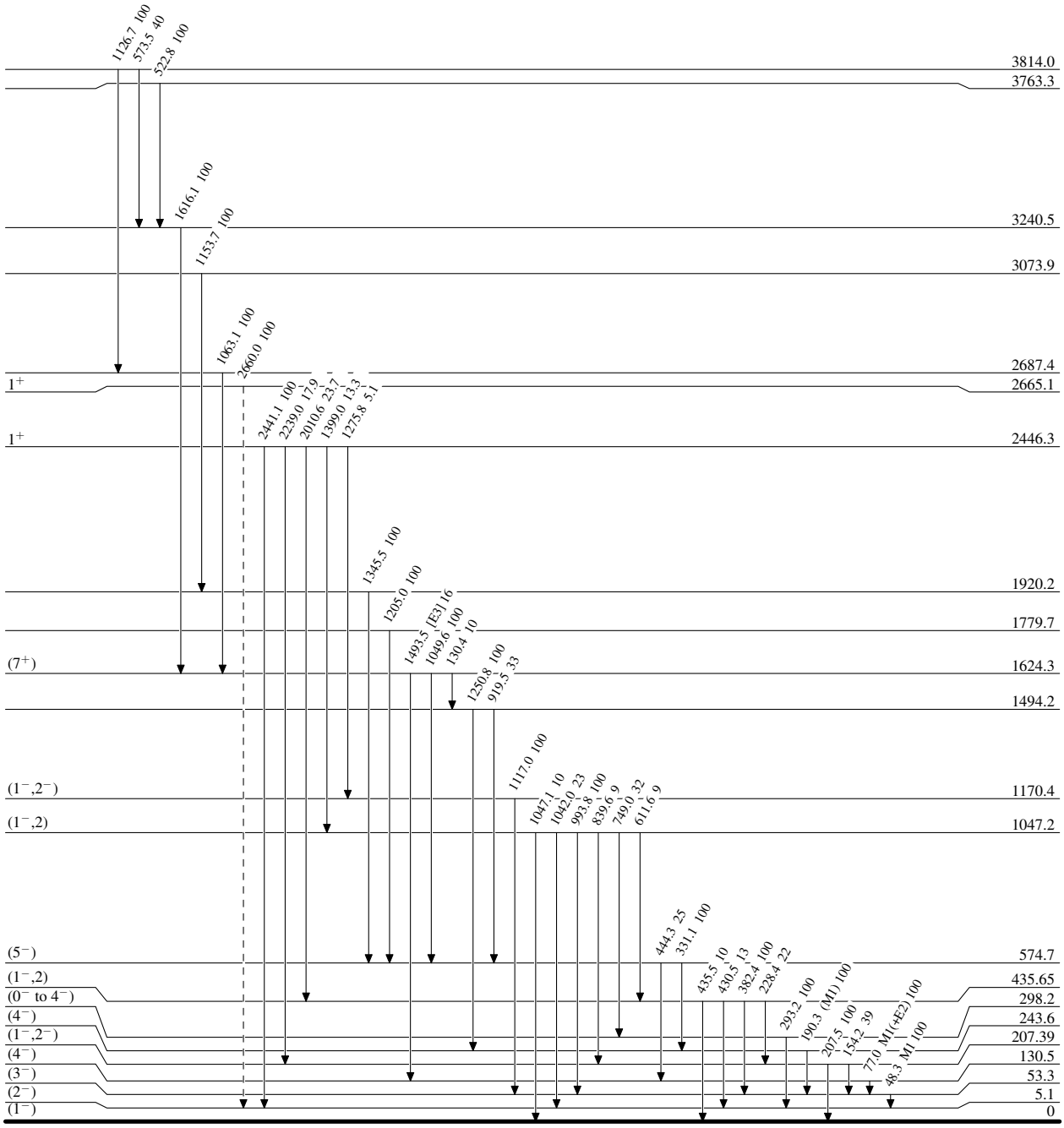
Adopted Levels, Gammas

Legend

Level Scheme

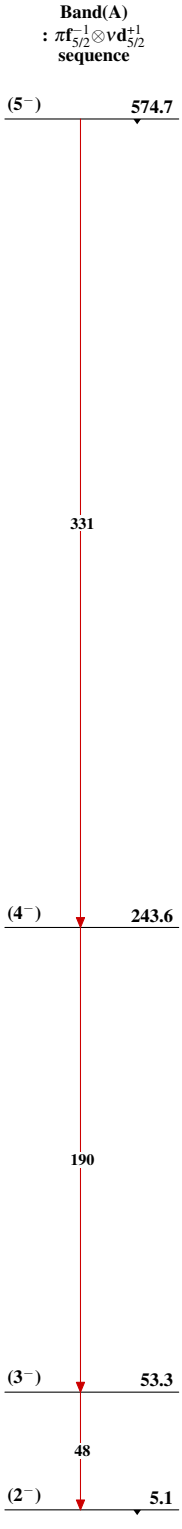
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{86}_{35}Br_{51}$

Adopted Levels, Gammas



$^{86}_{35}Br_{51}$