Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	G. Gürdal, E. A. Mccutchan	NDS 136, 1 (2016)	1-Jul-2016

Q(β^-)=−10480 *SY*; S(n)=13390 *40*; S(p)=2280 *15*; Q(α)=−1825 *SY* 2012Wa38
ΔQ(β^-)=200; ΔQ(α)= 16 (2012Wa38).
S(2n)=29130 *310*; S(2p)=7109 *15* (2012Wa38).

1978Al23: ^{58}Ni(^{14}N,2n) with E(^{14}N)=44 MeV; plastic scintillation detector used to detect β rays; measured $T_{1/2}$.

1981Vo04: from 600 MeV proton-irradiated Nb powder target; on-line mass separator; 4π β-detector; measured $T_{1/2}$ = 2.2 s *2* (from β(t)). Authors compared their measurement with literature value (1978Al23) and suggested isomerism might exist.

1988Bu12: ^{58}Ni(^{14}N,2n) with E(^{14}N)=42.5 MeV; rapid-transport target system with β-ray range telescope; measured $T_{1/2}$.

2002Lo13: fragmentation of ^{78}Kr beam at 73 MeV/nucleon using LISE/SISSI-ALPHA spectrometer at GANIL and identified through ΔE and TOF measurements. A four-element Si telescope (ΔE detector, position sensitive detector, double-sided Si strip detector as the implantation device and a Si(Li) detector as a veto for lighter ions). Measured $T_{1/2}$ from time correlation between ion implantation and β events in the silicon strip detector. Large $\Delta T_{1/2}$ due to the low production rate of ^{70}Br.

2014Ro14: produced by fragmentation of a ^{78}Kr beam on a natural Ni target with E(^{78}Kr)=70 MeV/nucleon. Separated using the LISE3 spectrometer and identified using ΔE-TOF measurements. A silicon telescope was used. Measured $T_{1/2}$ from time correlation between ion implantation and β events in the silicon strip detector.

1999Bo28: using ^{58}Ni(^{16}O,p3nγ) reaction, the gamma rays and level scheme were assigned to ^{70}Br, but in the erratum the authors have retracted the assignment to ^{70}Br.

α: Additional information 1.

^{70}Br Levels

Cross Reference (XREF) Flags

- A ^{70}Kr ε decay
- B ^{9}Be(^{71}Br,^{70}Brγ)
- C ^{40}Ca(^{36}Ar,αpnγ),(^{32}S,pnγ)

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[#]	XREF	Comments
0.0	0^+	79.1 ms *8*	ABC	%ε+%β^+=100 $T_{1/2}$: weighted average of 80.2 ms *8* (1978Al23, from β(t)) and 78.5 ms *6* (1988Bu12, from β(t)). Other: 79 ms *36* (2002Lo13) and 70 ms *19* (2014Ro14). J$^\pi$: super allowed ε to 0^+ ^{70}Se.
933.6 *3*	2^+	2.74 ps *40*	BC	J$^\pi$: 933.6γ E2 to 0^+.
1336.4 *4*	(3^+)	22 ps *10*	BC	J$^\pi$: 402.6γ D to 2^+, 666γ from 4^+.
1657.0 *5*	(5^+)	374 ps *83*	BC	J$^\pi$: 320.7γ E2 to (3^+). $T_{1/2}$: from lineshape analysis of 321γ using forward angle data in 2014Ni09.
1760.4 *7*			C	J$^\pi$: (3^+) in 2002Je07.
2002.3 *4*	4^+		C	J$^\pi$: 1068.8γ E2 to 2^+.
2292.3[@] *8*	9^+	2.2 s *2*	C	%ε+%β^+=100 E(level): 2.23 MeV *9* deduced from decay energy of isomer and estimated Q value of ^{70}Br (2004Ka38). $T_{1/2}$: from β(t) in 1981Vo04. Other: 2.2 s *3* preliminary value given in 2002Ro25. %ε+%β^+: IT decay has not been observed. J$^\pi$: Allowed ε decay to 8^+, systematics.
2350.9 *5*	(5^+)		C	J$^\pi$: 348.6γ D to 4^+.
2677.0 *6*	(6^+)		C	J$^\pi$: 326.1γ D to (5^+).
2683.0 *7*	7^+		C	J$^\pi$: 1026.0γ E2 to 5^+, 390.7γ to 9^+.
3027.3[a] *8*	(8^+)		C	J$^\pi$: 344.4γ D to 7^+, 734.8γ to 9^+.
3098.5[&] *9*	(10^+)		C	J$^\pi$: 806.2γ D+Q to 9^+.
3547.2[@] *8*	11^+		C	J$^\pi$: 1254.8γ E2 to 9^+.

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Adopted Levels, Gammas (continued)

^{70}Br Levels (continued)

E(level)[†]	J$^\pi$[‡]	XREF	Comments
3681.1 *8*	(8$^+$)	C	J$^\pi$: 765.0γ E2 from (10$^+$).
4446.2[a] *9*	(10$^+$)	C	J$^\pi$: 765γ E2 to (8$^+$).
4531.2[&] *10*	(12$^+$)	C	J$^\pi$: 1432.6γ to (10$^+$); assumed E2 cascade member.
4884.8[@] *9*	(13$^+$)	C	J$^\pi$: 1337.6γ to 11$^+$; assumed E2 cascade member.
5443.3[a] *10*	(12$^+$)	C	J$^\pi$: 997.1γ to (10$^+$); assumed E2 cascade member.
6050.9[&] *11*	(14$^+$)	C	J$^\pi$: 1519.7γ to (12$^+$); assumed E2 cascade member.
6487.4[@] *10*	(15$^+$)	C	J$^\pi$: 1602.6γ to (13$^+$); assumed E2 cascade member.
6787.9[a] *11*	(14$^+$)	C	J$^\pi$: 1344.6γ to (12$^+$); assumed E2 cascade member.
7659.1 *13*		C	J$^\pi$: (16$^+$) in 2002Je07.
7712.4[&] *12*	(16$^+$)	C	J$^\pi$: 1661.5γ to (14$^+$); assumed E2 cascade member.
8069.8[@] *11*	(17$^+$)	C	J$^\pi$: 1582.4γ to (15$^+$); assumed E2 cascade member.
8430.7[a] *13*	(16$^+$)	C	J$^\pi$: 1642.8γ to (14$^+$); assumed E2 cascade member.
9470.4 *13*		C	J$^\pi$: (18$^+$) in 2002Je07.
9507.4[&] *14*	(18$^+$)	C	J$^\pi$: 1795.0γ to (16$^+$); assumed E2 cascade member.
9782.0[@] *12*	(19$^+$)	C	J$^\pi$: 1712.2γ to (17$^+$); assuming E2 cascade member.
11667.1[@] *14*	(21$^+$)	C	J$^\pi$: 1885.0γ to (19$^+$); assumed E2 cascade member.
13786.0[@] *15*	(23$^+$)	C	J$^\pi$: 2118.9γ to (21$^+$); assumed E2 cascade member.
16157.7[@] *19*	(25$^+$)	C	J$^\pi$: 2371.7γ to (23$^+$); assumed E2 cascade member.
18662.8[@] *23*	(27$^+$)	C	J$^\pi$: 1866.2γ to (25$^+$); assumed E2 cascade member.
21411.9[@] *25*	(29$^+$)	C	J$^\pi$: 2749γ to (27$^+$); assumed E2 cascade member.

[†] From a least-squares fit to Eγ, by evaluators.
[‡] From ^{40}Ca(^{36}Ar,αpnγ),(^{32}S,pnγ) (2002Je07) based on multipolarity determined by DCO ratios and band structure. Additional parenthesis have been added by the evaluators in some cases.
[#] From RDDS in ^{9}Be(^{71}Br,^{70}Brγ) (2014Ni09), except where noted.
[@] Band(A): Configuration=$\pi g_{9/2}\otimes\nu g_{9/2}$,$\alpha$=1.
[&] Band(B): Configuration=$\pi g_{9/2}\otimes\nu g_{9/2}$,$\alpha$=0.
[a] Band(C): Band based on 3027, (8$^+$) level.

γ(^{70}Br)

E$_i$(level)	J$_i^\pi$	E$_\gamma$[†]	I$_\gamma$[†]	E$_f$	J$_f^\pi$	Mult.[‡]	α	Comments
933.6	2$^+$	933.6 *3*	100	0.0	0$^+$	E2	5.38×10^{-4}	α(K)=0.000479 *7*; α(L)=5.07×10^{-5} *8*; α(M)=8.05×10^{-6} *12*; α(N)=7.51×10^{-7} *11* B(E2)(W.u.)=17.0 *25*
1336.4	(3$^+$)	402.6 *3*	100	933.6	2$^+$	D	0.00320	α(K)=0.00285 *4*; α(L)=0.000304 *5*; α(M)=4.83×10^{-5} *7*; α(N)=4.52×10^{-6} *7*
1657.0	(5$^+$)	320.7 *3*	100	1336.4	(3$^+$)	E2	0.01264	α(K)=0.01116 *16*; α(L)=0.001259 *19*; α(M)=0.000200 *3*; α(N)=1.81×10^{-5} *3* B(E2)(W.u.)=26 *6*
1760.4		424.0 *5*	100	1336.4	(3$^+$)			
2002.3	4$^+$	665.7 *3*		1336.4	(3$^+$)			
		1068.8 *3*		933.6	2$^+$	E2	3.92×10^{-4}	α(K)=0.000349 *5*; α(L)=3.68×10^{-5} *6*; α(M)=5.84×10^{-6} *9*; α(N)=5.46×10^{-7} *8*
2350.9	(5$^+$)	348.6 *4*		2002.3	4$^+$	D	0.00453	α(K)=0.00402 *6*; α(L)=0.000430 *7*; α(M)=6.84×10^{-5} *10*; α(N)=6.39×10^{-6} *10*
		694.0 *4*		1657.0	(5$^+$)			

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Adopted Levels, Gammas (continued)

γ(^{70}Br) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α	Comments
2677.0	(6$^+$)	326.1 *3*	100	2350.9	(5$^+$)	D	0.00532	α(K)=0.00473 *7*; α(L)=0.000507 *8*; α(M)=8.06×10^{-5} *12*; α(N)=7.53×10^{-6} *11*
2683.0	7$^+$	390.7 *4*	47 *7*	2292.3	9$^+$			
		1026.0 *5*	100 *13*	1657.0	(5$^+$)	E2	4.30×10^{-4}	α(K)=0.000383 *6*; α(L)=4.05×10^{-5} *6*; α(M)=6.42×10^{-6} *9*; α(N)=6.00×10^{-7} *9*
3027.3	(8$^+$)	344.4 *5*	100 *11*	2683.0	7$^+$	D	0.00466	α(K)=0.00414 *6*; α(L)=0.000443 *7*; α(M)=7.05×10^{-5} *11*; α(N)=6.59×10^{-6} *10*
		734.8 *4*	76 *13*	2292.3	9$^+$			
3098.5	(10$^+$)	806.2 *4*	100	2292.3	9$^+$	D+Q		
3547.2	11$^+$	1254.8 *3*	100	2292.3	9$^+$	E2	2.93×10^{-4}	α(K)=0.000245 *4*; α(L)=2.57×10^{-5} *4*; α(M)=4.08×10^{-6} *6*; α(N)=3.82×10^{-7} *6*
3681.1	(8$^+$)	998.0 *5*	100	2683.0	7$^+$			
4446.2	(10$^+$)	765.0 *4*	39 *7*	3681.1	(8$^+$)	E2	8.87×10^{-4}	α(K)=0.000789 *11*; α(L)=8.43×10^{-5} *12*; α(M)=1.337×10^{-5} *19*; α(N)=1.243×10^{-6} *18*
		1418.6 *7*	100 *9*	3027.3	(8$^+$)	E2	2.70×10^{-4}	α(K)=0.000189 *3*; α(L)=1.98×10^{-5} *3*; α(M)=3.14×10^{-6} *5*; α(N)=2.94×10^{-7} *5*
		2155.0 *12*	23 *4*	2292.3	9$^+$			
4531.2	(12$^+$)	1432.6 *5*	100	3098.5	(10$^+$)			
4884.8	(13$^+$)	1337.6 *3*	100	3547.2	11$^+$			
5443.3	(12$^+$)	997.1 *5*	100	4446.2	(10$^+$)			
6050.9	(14$^+$)	1519.7 *4*	100	4531.2	(12$^+$)			
6487.4	(15$^+$)	1602.6 *4*	100	4884.8	(13$^+$)			
6787.9	(14$^+$)	1344.6 *5*	100	5443.3	(12$^+$)			
7659.1		1608.2 *6*	100	6050.9	(14$^+$)			
7712.4	(16$^+$)	1661.5 *5*	100	6050.9	(14$^+$)			
8069.8	(17$^+$)	1582.4 *4*	100	6487.4	(15$^+$)			
8430.7	(16$^+$)	1642.8 *6*	100	6787.9	(14$^+$)			
9470.4		1758.0 *5*	100	7712.4	(16$^+$)			
9507.4	(18$^+$)	1795.0 *6*	100	7712.4	(16$^+$)			
9782.0	(19$^+$)	1712.2 *6*	100	8069.8	(17$^+$)			
11667.1	(21$^+$)	1885.0 *6*	100	9782.0	(19$^+$)			
13786.0	(23$^+$)	2118.9 *7*	100	11667.1	(21$^+$)			
16157.7	(25$^+$)	2371.7 *11*	100	13786.0	(23$^+$)			
18662.8	(27$^+$)	2505.0 *13*	100	16157.7	(25$^+$)			
21411.9	(29$^+$)	2749	100	18662.8	(27$^+$)			

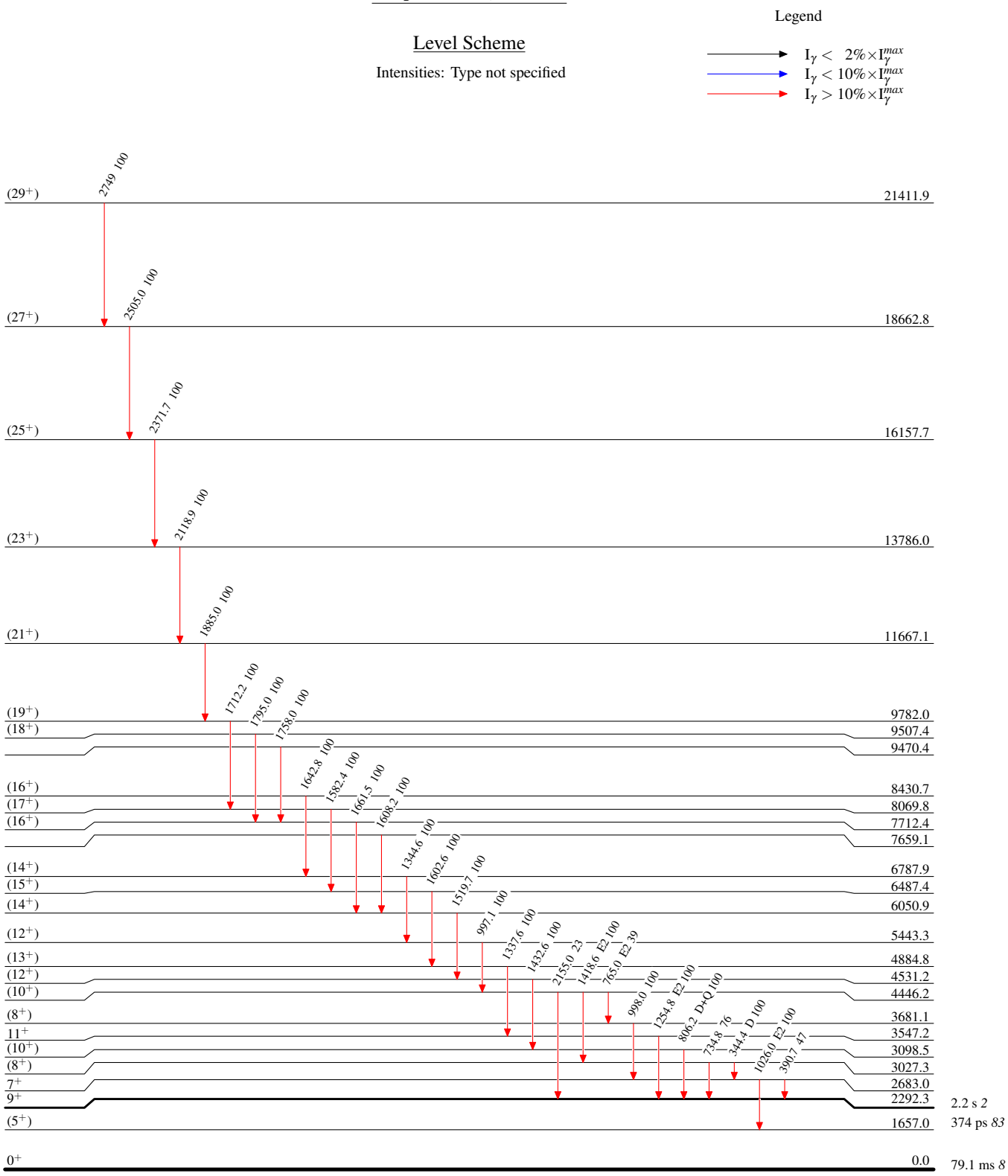
[†] From ^{40}Ca(^{36}Ar,αpnγ),(^{32}S,pnγ) (2002Je07).

[‡] From DCO ratios in ^{40}Ca(^{36}Ar,αpnγ),(^{32}S,pnγ). Stretched Q are assumed E2.

Adopted Levels, Gammas

Level Scheme

Intensities: Type not specified

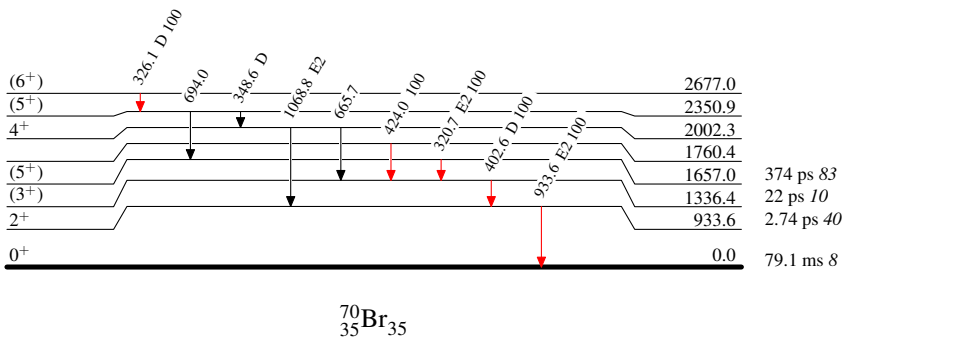


$^{70}_{35}Br_{35}$

Adopted Levels, Gammas

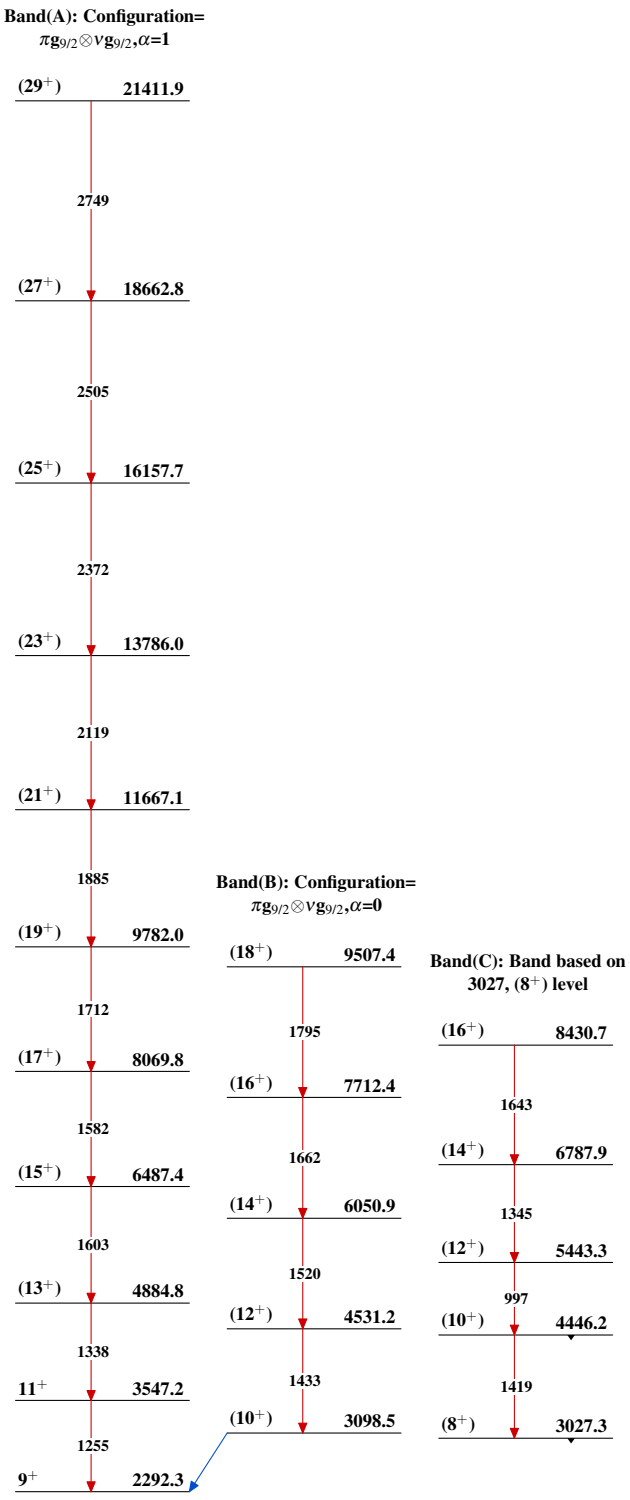
Level Scheme (continued)

Intensities: Type not specified



$^{70}_{35}Br_{35}$

Adopted Levels, Gammas



$^{70}_{35}Br_{35}$