$^{51}V(^{82}Se,3n\gamma)$ 1989Go04,1989Go06,1989Go13

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 93, 33 (2001)	11-May-2001

1989Go04 and 1989Go06: E=290 MeV. Measured Eγ, Iγ, γγ, γ(θ), excitation functions.
1989Go13: E=290 MeV. Measured γ, γγ. Deduced SD band.

^{130}La Levels

E(level)	Jπ†	Comments
0+x		
5.1+x *5*	(4)	
45.1+x *10*		
88.4+x[b] *7*	(3⁻)	Jπ: (6⁻) In Adopted Levels.
113.9+x *4*	(5)	
150.3+x *8*	(5)	
160.3+x *5*	(4)	
160.4+x[a] *5*	(4⁻)	Jπ: (7⁻) In Adopted Levels.
279.0+x[b] *5*	(5⁻)	
385.4+x[c] *4*	(6⁺)	Jπ: (9⁺) In Adopted Levels.
456.3+x[a] *5*	(6⁻)	
522.9+x[d] *5*	(7⁺)	Jπ: (10⁺) In Adopted Levels.
677.5+x[b] *6*	(7⁻)	
802.2+x[c] *5*	(8⁺)	
947.0+x[a] *6*	(8⁻)	
1048.5+x[d] *5*	(9⁺)	
1250.2+x[b] *6*	(9⁻)	
1422.8+x[c] *6*	(10⁺)	
1597.3+x[a] *6*	(10⁻)	
1748.5+x[d] *6*	(11⁺)	
1970.1+x[b] *7*	(11⁻)	
2194.1+x[c] *6*	(12⁺)	
2384.4+x[a] *7*	(12⁻)	
2586.7+x[d] *6*	(13⁺)	
2818.2+x[b] *7*	(13⁻)	
3096.1+x[c] *7*	(14⁺)	
3289.5+x[a] *7*	(14⁻)	
3541.5+x[d] *7*	(15⁺)	
3771.4+x[b] *8*	(15⁻)	
4105.0+x[c] *7*	(16⁺)	
4271.6+x[a] *8*	(16⁻)	
4589.6+x[d] *7*	(17⁺)	
4720.2+x[b] *8*	(17⁻)	
5185.0+x[a] *8*	(18⁻)	
5185.2+x[c] *8*	(18⁺)	
5644.5+x[b] *8*	(19⁻)	
5696.8+x[d] *10*	(19⁺)	
6156.8+x[a] *8*	(20⁻)	
6658.1+x[b] *8*	(21⁻)	
6818.8+x[d] *17*	(21⁺)	
7203.2+x[a] *10*	(22⁻)	

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$^{51}V(^{82}Se,3n\gamma)$ 1989Go04,1989Go06,1989Go13 (continued)

^{130}La Levels (continued)

E(level)	J^{π}†	E(level)	J^{π}†	E(level)	J^{π}†
7759.0+x[b] *10*	(23⁻)	1841.2+y[e] *10*	(14)	1613.9+z[f]	J+4
7949.8+x[d] *22*	(23⁺)	2305.6+y[e] *10*	(15)	2534.4+z[f]	J+6
8282.7+x[a] *11*	(24⁻)	2807.9+y[e] *10*	(16)	3532.1+z[f]	J+8
0.0+y‡	(7)	3340.0+y[e] *11*	(17)	4604.7+z[f]	J+10
86.9+y# *9*	(9)	3889.5+y[e] *12*	(18)	5753.0+z[f]	J+12
358.8+y[e] *5*	(9)	4462.0+y[e] *13*	(19)	6982.4+z[f]	J+14
489.7+y@[e] *7*	(10)	5054.8+y[e] *13*	(20)	8301.0+z[f]	J+16
732.6+y[e] *8*	(11)	5638.0+y[e] *14*	(21)	9713.4+z[f]	J+18
1046.6+y[e] *9*	(12)	z[f]	J≈(16)&		
1418.2+y[e] *9*	(13)	762.4+z[f]	J+2		

† From 1989Go04 and 1989Go06 based on their $\gamma(\theta)$ and $\gamma\gamma(\theta)$ data, and assigned band structures. The adopted J^{π}'s for $\pi h_{11/2}\nu h_{11/2}$ and $\pi h_{11/2}\nu g_{7/2}$ bands, based on assignments by 1987Pa27, 2001Ko30 and 1996Li13, are higher by 3 units of spin.

‡ y>700. This level decays solely to (6⁻) via unseen transitions.

Decays to 802+x, (8⁺) through unidentified γ rays.

@ Also decays to 677+x, (7⁻) through unidentified γ rays.

& From 1989Go13.

[a] Band(A): $\pi h_{11/2}\nu g_{7/2}$, α=0.

[b] Band(a): $\pi h_{11/2}\nu g_{7/2}$, α=1.

[c] Band(B): $\pi h_{11/2}\nu h_{11/2}$, α=0.

[d] Band(b): $\pi h_{11/2}\nu h_{11/2}$, α=1.

[e] Band(C): Collective oblate band. Only 32% of the intensity of this band deexcites to other bands; 13% feeds the positive-parity band and 19% feeds the negative-parity band (1989Go06).

[f] Band(D): SD band (1989Go13). Percent population=10 in $^{51}V(^{82}Se,3n\gamma)$ (1989Go13).

$\gamma(^{130}La)$

E_{γ}†‡	I_{γ}†	E_i(level)	J_i^{π}	E_f	J_f^{π}	Comments
46.4 *5*	<1	160.4+x	(4⁻)	113.9+x	(5)	
72.0 *5*	6.2 *2*	160.4+x	(4⁻)	88.4+x	(3⁻)	
105.2 *5*	1.7 *2*	150.3+x	(5)	45.1+x		
106.4 *5*	4.0 *3*	385.4+x	(6⁺)	279.0+x	(5⁻)	
113.9 *5*	2.8 *2*	113.9+x	(5)	0+x		
118.7 *3*	55.2 *3*	279.0+x	(5⁻)	160.4+x	(4⁻)	
130.9 *5*	8.3 *6*	489.7+y	(10)	358.8+y	(9)	
137.5 *3*	100	522.9+x	(7⁺)	385.4+x	(6⁺)	
177.2 *3*	63.5 *9*	456.3+x	(6⁻)	279.0+x	(5⁻)	
190.7 *7*	1.4@ *5*	279.0+x	(5⁻)	88.4+x	(3⁻)	Br(191/119)=2.5 *9*/97.5 *9*.
221.2 *3*	41.1 *7*	677.5+x	(7⁻)	456.3+x	(6⁻)	
225.1 *3*	15.2 *7*	385.4+x	(6⁺)	160.3+x	(4)	
235.1 *7*	>30#	385.4+x	(6⁺)	150.3+x	(5)	I_{γ}: from intensity balance.
242.9 *3*	15.1 *7*	732.6+y	(11)	489.7+y	(10)	
246.3 *3*	68.3 *16*	1048.5+x	(9⁺)	802.2+x	(8⁺)	
269.5 *7*	22.2@ *9*	947.0+x	(8⁻)	677.5+x	(7⁻)	
271.5 *3*	55.8 *22*	385.4+x	(6⁺)	113.9+x	(5)	
279.4 *3*	91 *4*	802.2+x	(8⁺)	522.9+x	(7⁺)	

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$^{51}V(^{82}Se,3n\gamma)$ 1989Go04,1989Go06,1989Go13 (continued)

$\gamma(^{130}La)$ (continued)

E_γ †‡	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Comments
295.9 *3*	10.6 *3*	456.3+x	(6^-)	160.4+x	(4^-)	Br(296/177)=12.1 *14*/87.9 *14*.
303.2 *3*	19.9 *5*	1250.2+x	(9^-)	947.0+x	(8^-)	
314.0 *3*	16.9 *13*	1046.6+y	(12)	732.6+y	(11)	
325.7 *3*	31.7 *13*	1748.5+x	(11^+)	1422.8+x	(10^+)	
347.1 *7*	11.9@ *8*	1597.3+x	(10^-)	1250.2+x	(9^-)	
358.8 *5*	7.0 *6*	358.8+y	(9)	0.0+y	(7)	
371.6 *3*	16.0 *12*	1418.2+y	(13)	1046.6+y	(12)	
372.8 *7*	12.6@ *8*	1970.1+x	(11^-)	1597.3+x	(10^-)	
374.3 *7*	36@ *3*	1422.8+x	(10^+)	1048.5+x	(9^+)	
380.3 *3*	22.4 *10*	385.4+x	(6^+)	5.1+x	(4)	
385.4 *5*	7.3 *5*	385.4+x	(6^+)	0+x		
392.6 *3*	15.9 *8*	2586.7+x	(13^+)	2194.1+x	(12^+)	
398.4 *3*	20.1 *6*	677.5+x	(7^-)	279.0+x	(5^-)	Br(398/221)=31.8 *16*/68.2 *16*.
402.8 *5*	4.7 *4*	489.7+y	(10)	86.9+y	(9)	
414.3 *5*	4.2 *5*	2384.4+x	(12^-)	1970.1+x	(11^-)	
416.9 *5*	<1	802.2+x	(8^+)	385.4+x	(6^+)	Br(417/279)=3.5 *21*/96.5 *21*.
423.0 *3*	13.1 *10*	1841.2+y	(14)	1418.2+y	(13)	
433.8 *5*	2.7 *4*	2818.2+x	(13^-)	2384.4+x	(12^-)	
445.4 *7*	#	3541.5+x	(15^+)	3096.1+x	(14^+)	
445.6 *7*	29@ *4*	2194.1+x	(12^+)	1748.5+x	(11^+)	
448.6 *5*	8.4 *6*	4720.2+x	(17^-)	4271.6+x	(16^-)	
459.4 *5*	5.7 *6*	5644.5+x	(19^-)	5185.0+x	(18^-)	
464.4 *3*	11.5 *9*	2305.6+y	(15)	1841.2+y	(14)	
464.8 *5*	9.0 *7*	5185.0+x	(18^-)	4720.2+x	(17^-)	
471.3 *5*	3.0 *4*	3289.5+x	(14^-)	2818.2+x	(13^-)	
481.8 *5*	3.0 *4*	3771.4+x	(15^-)	3289.5+x	(14^-)	
484.6 *7*	3.6@ *9*	4589.6+x	(17^+)	4105.0+x	(16^+)	
490.7 *3*	25.3 *7*	947.0+x	(8^-)	456.3+x	(6^-)	Br(491/269)=53.3 *11*/46.7 *11*.
500.2 *7*	3.1@ *9*	4271.6+x	(16^-)	3771.4+x	(15^-)	
501.5 *7*	2.2@ *5*	6658.1+x	(21^-)	6156.8+x	(20^-)	
502.3 *5*	9.0 *8*	2807.9+y	(16)	2305.6+y	(15)	
509.5 *7*	#	3096.1+x	(14^+)	2586.7+x	(13^+)	
511.7 *7*	2.8@ *9*	5696.8+x	(19^+)	5185.2+x	(18^+)	
512.4 *5*	4.5 *6*	6156.8+x	(20^-)	5644.5+x	(19^-)	
523.7 *5*	1.3 *9*	8282.7+x	(24^-)	7759.0+x	(23^-)	
525.7 *3*	33.7 *15*	1048.5+x	(9^+)	522.9+x	(7^+)	Br(526/246)=30.8 *14*/69.2 *14*.
532.1 *5*	5.9 *6*	3340.0+y	(17)	2807.9+y	(16)	
545.0 *7*	#	7203.2+x	(22^-)	6658.1+x	(21^-)	
549.5 *5*	3.1 *4*	3889.5+y	(18)	3340.0+y	(17)	
555.8 *7*	0.3@ *2*	7759.0+x	(23^-)	7203.2+x	(22^-)	
563.5 *5*	8.5 *10*	4105.0+x	(16^+)	3541.5+x	(15^+)	
572.5 *5*	4.0 *5*	4462.0+y	(19)	3889.5+y	(18)	
572.7 *3*	33.4 *9*	1250.2+x	(9^-)	677.5+x	(7^-)	Br(573/303)=64.8 *13*/35.2 *13*.
583.2 *5*	1.1 *2*	5638.0+y	(21)	5054.8+y	(20)	
592.8 *5*	1.2 *3*	5054.8+y	(20)	4462.0+y	(19)	
595.6 *5*	2.2 *6*	5185.2+x	(18^+)	4589.6+x	(17^+)	
620.6 *3*	13.9 *9*	1422.8+x	(10^+)	802.2+x	(8^+)	Br(621/374)=28.3 *19*/71.7 *19*.
650.3 *3*	30.2 *9*	1597.3+x	(10^-)	947.0+x	(8^-)	Br(650/347)=71.8 *15*/28.2 *15*.
700.0 *3*	66 *3*	1748.5+x	(11^+)	1048.5+x	(9^+)	Br(700/326)=59.5 *11*/40.5 *11*.
719.9 *3*	31.9 *10*	1970.1+x	(11^-)	1250.2+x	(9^-)	Br(720/373)=71.7 *16*/28.3 *16*.
762.4	0.35&	762.4+z	J+2	z	J≈(16)	
771.3 *3*	21.5 *12*	2194.1+x	(12^+)	1422.8+x	(10^+)	Br(771/446)=42 *3*/58 *3*.
787.1 *3*	27.8 *11*	2384.4+x	(12^-)	1597.3+x	(10^-)	Br(787/414)=85.6 *18*/14.4 *18*.

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$^{51}V(^{82}Se,3n\gamma)$ 1989Go04,1989Go06,1989Go13 (continued)

$\gamma(^{130}La)$ (continued)

E_γ †‡	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Comments
838.2 *3*	42.6 *20*	2586.7+x	(13^+)	1748.5+x	(11^+)	Br(838/393)=76 *4*/24 *4*.
848.1 *3*	25.4 *10*	2818.2+x	(13^-)	1970.1+x	(11^-)	Br(848/434)=81.9 *21*/18.1 *21*.
851.5	0.80&	1613.9+z	J+4	762.4+z	J+2	
902.1 *7*	#	3096.1+x	(14^+)	2194.1+x	(12^+)	Br(902/510)=55 *3*/45 *3*.
905.1 *7*	17@ *3*	3289.5+x	(14^-)	2384.4+x	(12^-)	Br(905/471)=85.3 *23*/14.7 *23*.
913.4 *5*	7.7 *6*	5185.0+x	(18^-)	4271.6+x	(16^-)	Br(913/465)=48 *3*/52 *3*.
920.5	1.00&	2534.4+z	J+6	1613.9+z	J+4	
924.2 *5*	9.6 *13*	5644.5+x	(19^-)	4720.2+x	(17^-)	Br(924/459)=59 *3*/41 *3*.
948.8 *7*	11.9@ *20*	4720.2+x	(17^-)	3771.4+x	(15^-)	Br(949/449)=59 *5*/41 *5*.
953.1 *7*	#	3771.4+x	(15^-)	2818.2+x	(13^-)	
954.9 *7*	#	3541.5+x	(15^+)	2586.7+x	(13^+)	Br(955/445)=81 *3*/19 *3*.
966.7 *5*	1.6 *2*	2807.9+y	(16)	1841.2+y	(14)	Br(967/502)=14 *10*/85 *10*.
971.8 *5*	7.5 *10*	6156.8+x	(20^-)	5185.2+x	(18^+)	Br(972/512)=65 *4*/36 *4*.
982.0 *3*	11.5 *10*	4271.6+x	(16^-)	3289.5+x	(14^-)	Br(982/500)=78 *6*/22 *6*.
997.7	1.00&	3532.1+z	J+8	2534.4+z	J+6	
1008.9 *3*	17.4 *11*	4105.0+x	(16^+)	3096.1+x	(14^+)	Br(1009/563)=75 *4*/25 *4*.
1013.4 *5*	7.2 *10*	6658.1+x	(21^-)	5644.5+x	(19^-)	Br(1013/501)=77 *4*/23 *4*.
1034.4 *14*	1.8 *3*	3340.0+y	(17)	2305.6+y	(15)	Br(1034/532)=25 *7*/75 *7*.
1046.5 *5*	4.8 *10*	7203.2+x	(22^-)	6156.8+x	(20^-)	
1048.1 *3*	18.5 *12*	4589.6+x	(17^+)	3541.5+x	(15^+)	Br(1048/485)=84 *4*/16 *4*.
1072.6	1.00&	4604.7+z	J+10	3532.1+z	J+8	
1079.5 *14*	2.4 *10*	8282.7+x	(24^-)	7203.2+x	(22^-)	Br(1079/524)=90 *5*/10 *5*.
1080.2 *5*	6.6 *7*	5185.2+x	(18^+)	4105.0+x	(16^+)	Br(1080/596)=76 *5*/24 *5*.
1081.6 *14*	1.6 *2*	3889.5+y	(18)	2807.9+y	(16)	Br(1082/549)=31 *8*/70 *8*.
1100.8 *14*	3.0 *8*	7759.0+x	(23^-)	6658.1+x	(21^-)	Br(1101/556)=90 *5*/10 *5*.
1107 *1*	9.5 *9*	5696.8+x	(19^+)	4589.6+x	(17^+)	Br(1107/512)=77 *7*/23 *7*.
1122.0 *14*	1.5 *6*	6818.8+x	(21^+)	5696.8+x	(19^+)	
1122.0 *14*	1.3 *2*	4462.0+y	(19)	3340.0+y	(17)	Br(1122/572)=28 *15*/72 *15*.
1131.0 *14*	1.1 *3*	7949.8+x	(23^+)	6818.8+x	(21^+)	
1148.3	0.75&	5753.0+z	J+12	4604.7+z	J+10	
1165.3 *14*	1.0 *3*	5054.8+y	(20)	3889.5+y	(18)	Br(1165/593)=48 *8*/52 *8*.
1229.4	0.65&	6982.4+z	J+14	5753.0+z	J+12	
1318.6	0.50&	8301.0+z	J+16	6982.4+z	J+14	
1412.4	0.40&	9713.4+z	J+18	8301.0+z	J+16	

† From 1989Go04 and 1989Go06. For SD band, values are from 1989Go13.

‡ $\Delta(E\gamma)$=0.3 keV for $I\gamma$>10, 0.5 keV for $I\gamma$<10, 0.7 keV for doublets and 1.4 keV for weak high-energy (>1 MeV) transitions, based on general comments by 1989Go04 and 1989Go06.

Doublet, $I\gamma$ not determined.

@ Doublet, $I\gamma$ from branching ratio.

& Relative intensity within the SD band.

$^{51}V(^{82}Se,3n\gamma)$ 1989Go04,1989Go06,1989Go13

Level Scheme

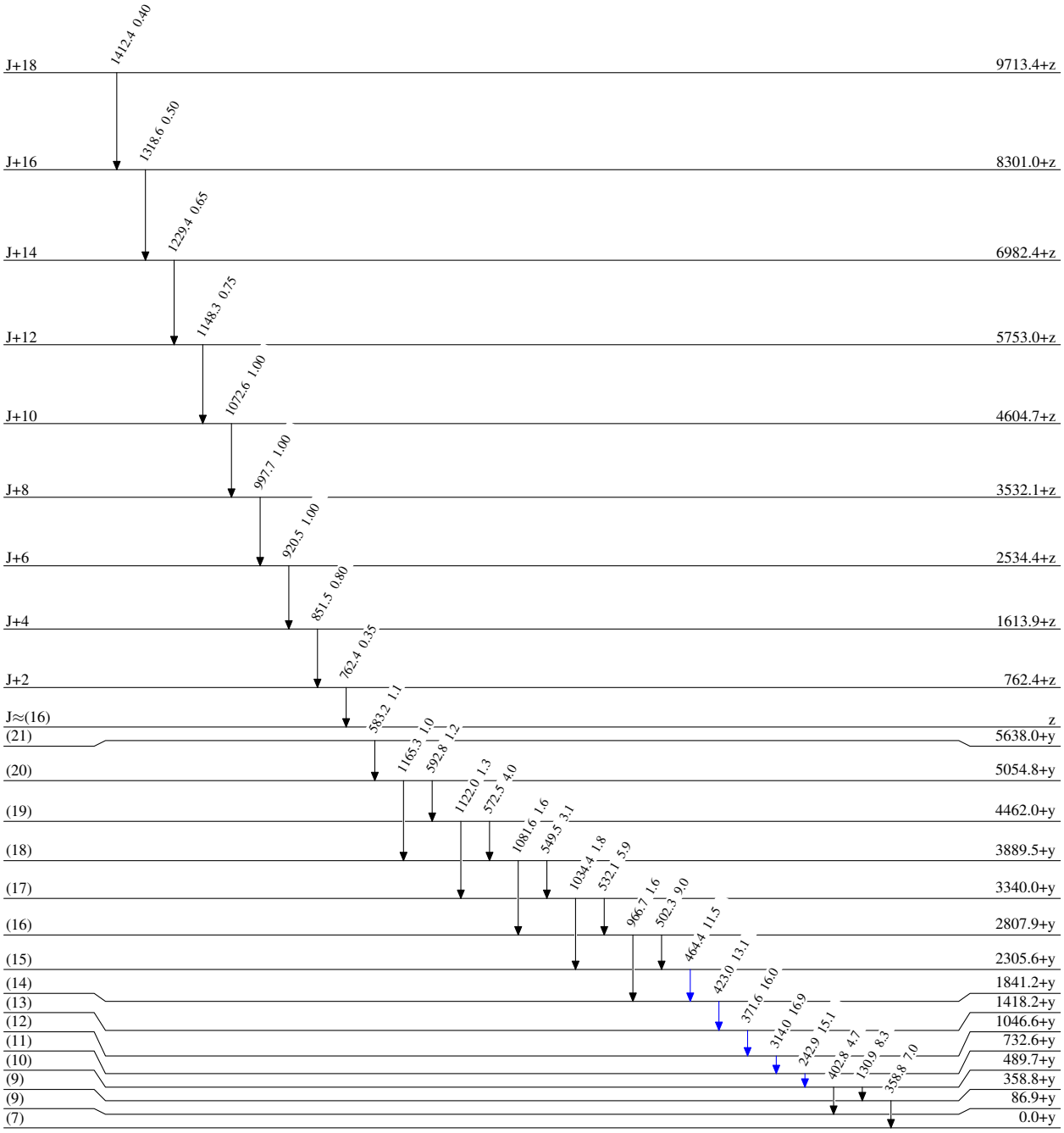
Intensities: Relative I_γ

Legend

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

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

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



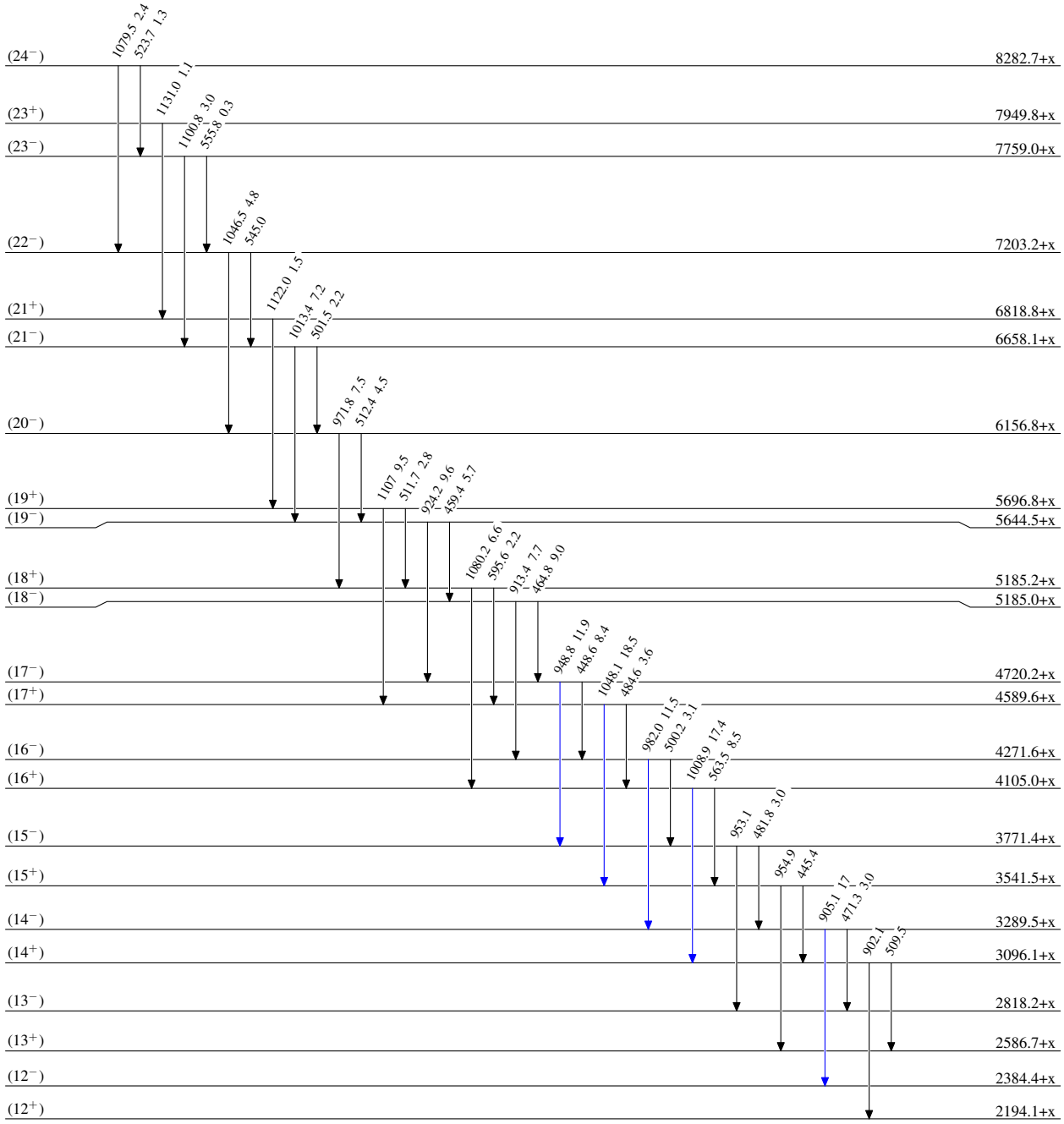
$^{130}_{57}La_{73}$

$^{51}V(^{82}Se,3n\gamma)$ 1989Go04,1989Go06,1989Go13

Level Scheme (continued)

Intensities: Relative I_γ

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$



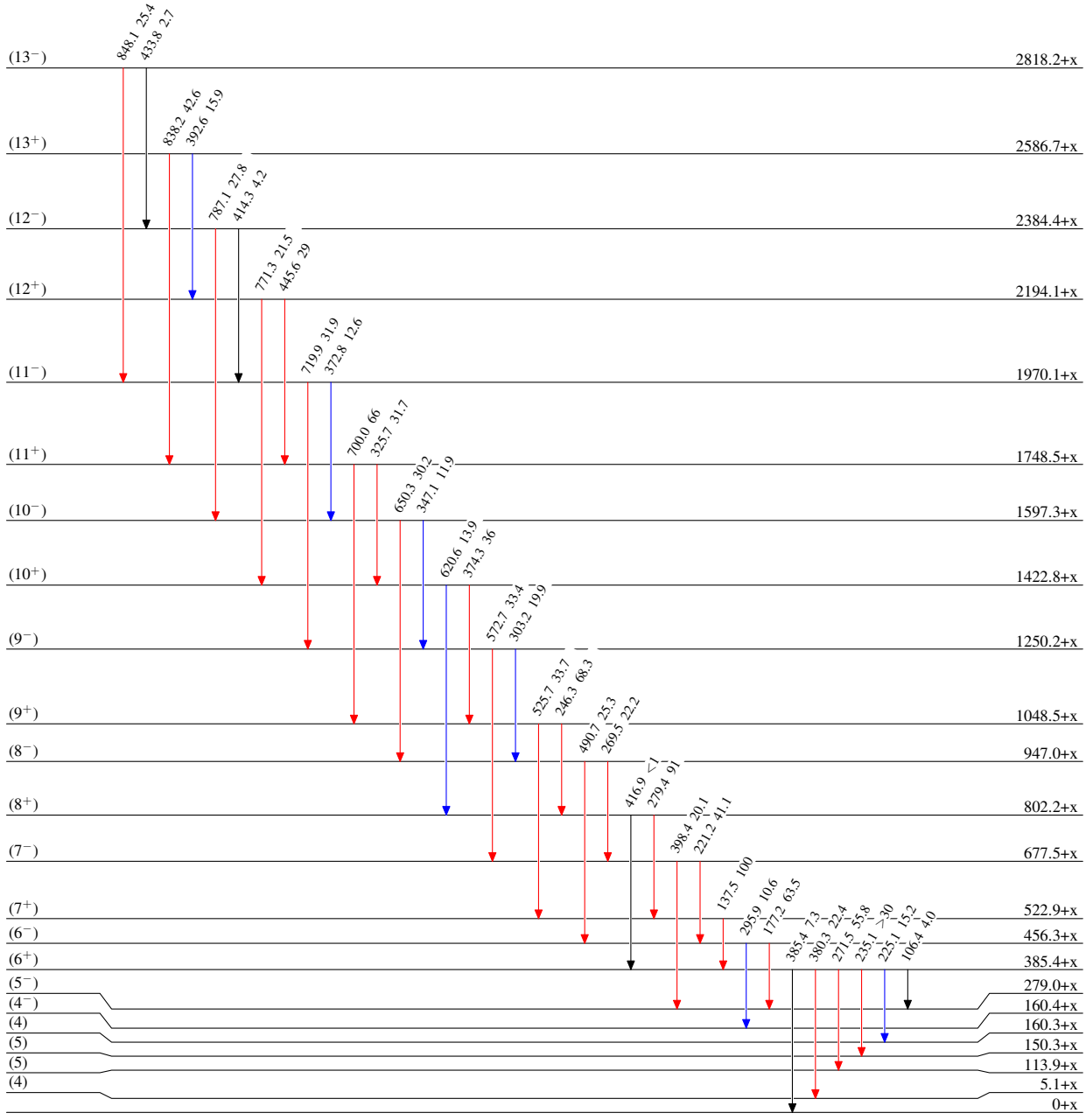
$^{130}_{57}La_{73}$

$^{51}V(^{82}Se,3n\gamma)$ 1989Go04,1989Go06,1989Go13

Level Scheme (continued)

Intensities: Relative I_γ

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



$^{130}_{57}La_{73}$

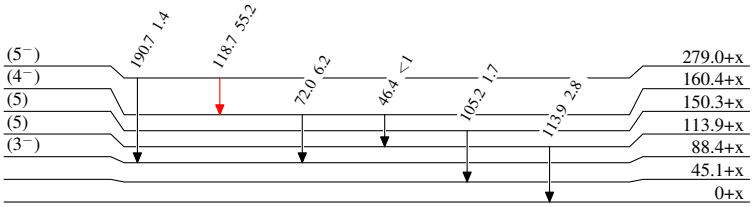
$^{51}V(^{82}Se,3n\gamma)$ 1989Go04,1989Go06,1989Go13

Level Scheme (continued)

Intensities: Relative I_γ

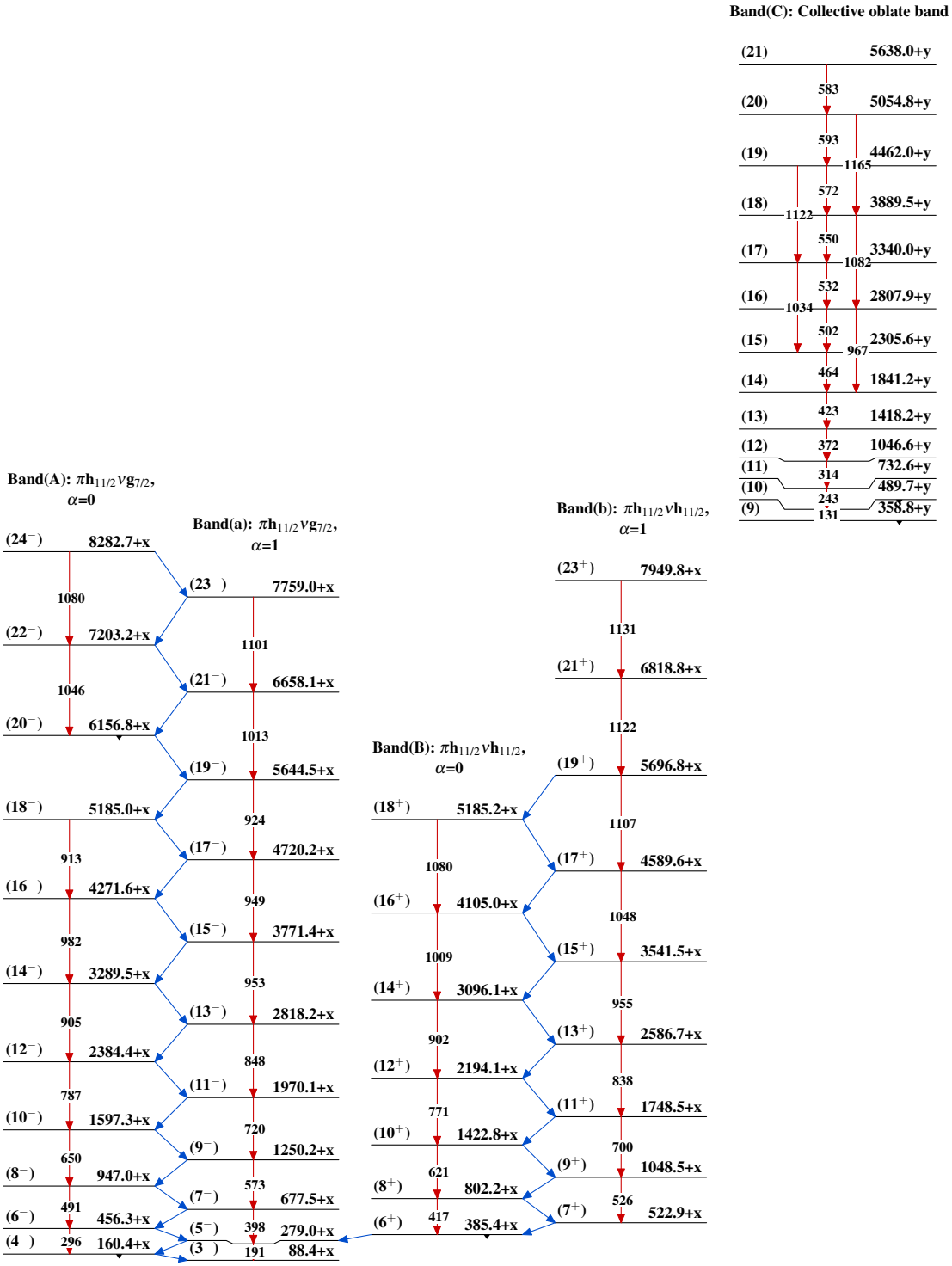
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



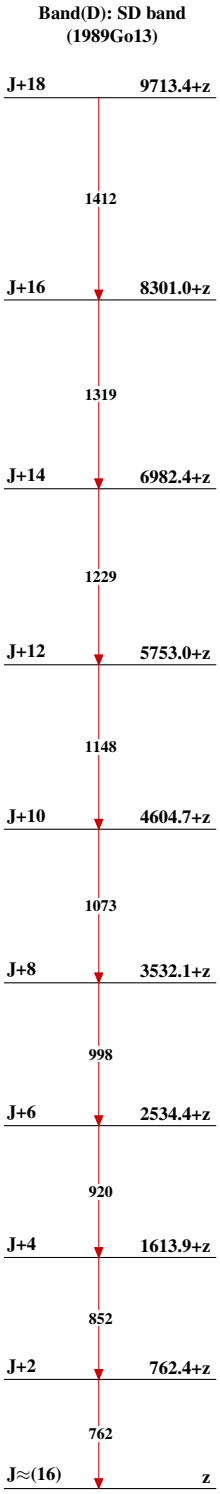
$^{130}_{57}La_{73}$

$^{51}V(^{82}Se,3n\gamma)$ 1989Go04,1989Go06,1989Go13



$^{130}_{57}La_{73}$

$^{51}V(^{82}Se,3n\gamma)$ 1989Go04,1989Go06,1989Go13 (continued)



$^{130}_{57}La_{73}$