^{76}Ge(^{11}B,3nγ) 2002Sc35

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 110,2815 (2009)	30-Sep-2009

2002Sc35: E(^{11}B)=50 and 45 MeV. Measured Eγ, Iγ, γγ, γγγ, γγ(θ)(DCO), lifetimes measured using the Doppler-shift attenuation method; GASP spectrometer consisting of 40 Compton-suppressed HPGe detectors and inner ball of 80 BGO detectors.
Others: the same collaboration 1998ScZN, 1998ScZW, 1999Sc14, 2000Sc17, and 2000Sc34.
Configuration assignments are based on comparison between observed states with these predicted using shell model (2002Sc35).
Note that the high spin part of the level scheme is different to that proposed in ^{70}Zn(^{18}O,p3nγ) (1999Ha37).

^{84}Rb Levels

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	Comments
0[b]	2$^-$	32.82 d 7	J$^{\pi}$,T$_{1/2}$: From Adopted Levels.
247.50[c] 10	3$^-$	0.31 ns 6	J$^{\pi}$,T$_{1/2}$: From Adopted Levels.
462.58[b] 23	6$^-$	20.26 min 4	J$^{\pi}$,T$_{1/2}$: From Adopted Levels.
465.89[c] 20	5$^-$		
471.78[c] 14	4$^{(-)}$		
542.38[&] 21	5$^{(+)}$		
571.8[&] 7	6$^{(+)}$		
618.6[&] 5	7$^{(+)}$		
676.98[b] 25	7$^{(-)}$		
701.7[&] 5	8$^{(+)}$		
1332.6[&] 5	9$^{(+)}$	0.59 ps 10	
1396.8[d] 4	8$^{(-)}$		
1661.3 5	(8$^-$)		
1744.2 10	(7$^-$)		
1756.8[&] 5	10$^{(+)}$	1.11 ps 14	
1870.7 6	(9$^+$)		
2067.0[d] 5	(9$^-$)		
2427.7[a] 5	10$^{(+)}$		
2460.8 4	9$^{(-)}$		
2468.2 7	(10$^-$)		
2475.5[&] 5	11$^{(+)}$	0.194 ps 21	
2709.6 5	10$^{(-)}$		
2916.8[a] 5	(11$^+$)		
2935.7 4	10$^{(-)}$		
2971.4 5	(9$^-$)		
3027.2 5	10$^{(-)}$		
3106.9 5	10$^{(-)}$		
3121.0 4	11$^{(-)}$		
3165.9[&] 5	12$^{(+)}$	<0.83[@] ps	
3393.8[f] 5	11$^{(-)}$		
3407.2[a] 5	(12$^+$)		
3560.1 5	12$^{(-)}$		
3679.8[e] 5	12$^{(-)}$		
3720.5[f] 5	12$^{(-)}$		
3785.1 5	13$^{(-)}$		
4129.9[e] 5	13$^{(-)}$	0.28 ps 5	
4165.7[f] 5	13$^{(-)}$	0.57 ps 8	
4245.4[a] 6			

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^{76}Ge(^{11}B,3nγ) 2002Sc35 (continued)

^{84}Rb Levels (continued)

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[#]	E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[#]	E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[#]
4713.7[f] 5	14$^{(-)}$	0.263 ps 21	5370.8[f] 5	15$^{(-)}$	0.173 ps 28	6860.2[f] 7	(17$^-$)	<0.31[@] ps
4800.4[e] 5	14$^{(-)}$	0.049 ps 14	5932.3[e] 5	16$^{(-)}$	0.076 ps 14	7381.7[e] 7	(18$^-$)	
4823.6[&] 7	14$^{(+)}$		6093.8[f] 6	(16$^-$)	0.111 ps 28			
5253.5[e] 5	15$^{(-)}$	0.44 ps 6	6470.7[e] 6	17$^{(-)}$	<0.36[@] ps			

[†] From a least-squares fit to Eγ.
[‡] From 2002Sc35, based on $\gamma\gamma(\theta)$(DCO) and the apparent band structure, unless otherwise specified.
[#] From DSAM (lineshape analysis) in 2002Sc35, unless otherwise specified. The uncertainties of the electronic and nuclear stopping power, which may be of the order of 10 %, are not included.
[@] Effective value, not corrected for side-feeding.
[&] Band(A): Band based on $\pi(g_{9/2})\nu(g_{9/2})$ configuration at J$^\pi$ < 9$^+$ and $\pi(g_{9/2})\nu(g^3_{9/2})$ configuration at and above J$^\pi$=9$^+$.
[a] Band(B): Band based on $\pi(p_{3/2},f_{5/2},g_{9/2})\nu(g_{9/2})$ configuration at 2429 keV.
[b] Band(C): State dominated by the $\pi(f_{5/2})\nu(g_{9/2})$ configuration.
[c] Band(D): State dominated by the $\pi(p_{3/2})\nu(g_{9/2})$ configuration.
[d] Band(E): State dominated by the $\pi(p_{1/2},p_{3/2},f_{5/2})\nu(g_{9/2})$ configuration.
[e] Band(F): Magnetic dipole rotational band based on the $\pi(p_{3/2},g^2_{9/2})\nu(g_{9/2})$ configuration at 3681 keV.
[f] Band(G): Magnetic dipole rotational band based on the $\pi(p_{3/2},g^2_{9/2})\nu(g_{9/2})$ configuration at 3395 keV.

γ(^{84}Rb)

E$_\gamma$[†]	I$_\gamma$[†]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.[†]	Comments
29.2 9		571.8	6$^{(+)}$	542.38	5$^{(+)}$	(M1)[‡]	
46.6 9		618.6	7$^{(+)}$	571.8	6$^{(+)}$	(M1)[‡]	
70.7 2	299 37	542.38	5$^{(+)}$	471.78	4$^{(-)}$		
76.4 2	123 28	542.38	5$^{(+)}$	465.89	5$^-$		
79.8 1		542.38	5$^{(+)}$	462.58	6$^-$		
83.1 1	169 27	701.7	8$^{(+)}$	618.6	7$^{(+)}$	(M1)[‡]	
135.5 2	2.2 2	3106.9	10$^{(-)}$	2971.4	(9$^-$)		
185.5 1	44 2	3121.0	11$^{(-)}$	2935.7	10$^{(-)}$	(M1)	Mult.: DCO=1.0 1 , deduced by double gating on 83γ and 631γ.
214.4 1	39 7	676.98	7$^{(-)}$	462.58	6$^-$		
218.3 2	6.2 6	465.89	5$^-$	247.50	3$^-$	E2[‡]	
224.3 1	21 1	471.78	4$^{(-)}$	247.50	3$^-$		
225.0 1	20 1	3785.1	13$^{(-)}$	3560.1	12$^{(-)}$		
247.5 1	74 7	247.50	3$^-$	0	2$^-$		
286.8 2	7.5 6	3393.8	11$^{(-)}$	3106.9	10$^{(-)}$	(M1)	Mult.: DCO=0.9 1 , deduced by gating on 327γ.
326.6 1	28 2	3720.5	12$^{(-)}$	3393.8	11$^{(-)}$	(M1)	Mult.: DCO=1.0 1 , deduced by double gating on 83γ and 631γ.
344.9 2	6.0 4	4129.9	13$^{(-)}$	3785.1	13$^{(-)}$		
366.6 2	7.1 6	3393.8	11$^{(-)}$	3027.2	10$^{(-)}$	(M1)	Mult.: DCO=1.1 2 , deduced by gating on 327γ.
401.3 5	2.1 4	2468.2	(10$^-$)	2067.0	(9$^-$)		
411.4 1	18.4 9	3121.0	11$^{(-)}$	2709.6	10$^{(-)}$	(M1)	Mult.: DCO=0.96 9 , deduced by double gating on 83γ and 631γ.
424.4 1	58 3	1756.8	10$^{(+)}$	1332.6	9$^{(+)}$	M1	Mult.: DCO=0.86 5 , deduced by gating on 83γ.
439.1 1	34 2	3560.1	12$^{(-)}$	3121.0	11$^{(-)}$	(M1)	Mult.: DCO=0.9 1 , deduced by gating on 186γ.
445.1 1	43 2	4165.7	13$^{(-)}$	3720.5	12$^{(-)}$	M1	Mult.: DCO=1.1 1 , deduced by double gating on 83γ and 631γ.

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^{76}Ge(^{11}B,3nγ) 2002Sc35 (continued)

γ(^{84}Rb) (continued)

E_γ†	I_γ†	E_i(level)	J^π_i	E_f	J^π_f	Mult.†	Comments
450.3 *2*	23 *1*	4129.9	$13^{(-)}$	3679.8	$12^{(-)}$	M1	Mult.: DCO=1.2 *2* , deduced by gating on 186γ.
453.1 *1*	30 *2*	5253.5	$15^{(-)}$	4800.4	$14^{(-)}$	M1	Mult.: DCO=1.0 *1* , deduced by gating on 186γ.
474.9 *2*	6.9 *4*	2935.7	$10^{(-)}$	2460.8	$9^{(-)}$	(M1)	Mult.: DCO=0.9 *1* , deduced by gating on 186γ.
489.3 *2*	16.9 *11*	2916.8	(11^+)	2427.7	$10^{(+)}$		
490.4 *2*	23 *2*	3407.2	(12^+)	2916.8	(11^+)		
538.4 *2*	17.3 *9*	6470.7	$17^{(-)}$	5932.3	$16^{(-)}$	M1	Mult.: DCO=0.9 *2* , deduced by gating on 186γ.
548.0 *1*	34 *2*	4713.7	$14^{(-)}$	4165.7	$13^{(-)}$	M1	Mult.: DCO=1.0 *1* , deduced by double gating on 83γ and 631γ.
557.1 *5*	8.6 *9*	2427.7	$10^{(+)}$	1870.7	(9^+)		
558.9 *2*	37 *2*	3679.8	$12^{(-)}$	3121.0	$11^{(-)}$	(M1)	Mult.: DCO=1.1 *1* , deduced by gating on 186γ.
569.7 *2*	15.8 *9*	4129.9	$13^{(-)}$	3560.1	$12^{(-)}$	(M1)	Mult.: DCO=1.0 *2* , deduced by gating on 186γ.
599.8 *2*	23 *1*	3720.5	$12^{(-)}$	3121.0	$11^{(-)}$	(M1)	Mult.: DCO=1.0 *1* , deduced by gating on 186γ.
618.7 *3*	21 *1*	3785.1	$13^{(-)}$	3165.9	$12^{(+)}$		
630.9 *1*	100 *5*	1332.6	$9^{(+)}$	701.7	$8^{(+)}$	M1+E2	Mult.: DCO=0.82 *4* , deduced by gating on 83γ.
656.9 *2*	17.1 *11*	5370.8	$15^{(-)}$	4713.7	$14^{(-)}$	M1	Mult.: DCO=1.1 *1* , deduced by double gating on 83γ and 631γ.
670.6 *2*	33 *2*	4800.4	$14^{(-)}$	4129.9	$13^{(-)}$	M1	Mult.: DCO=1.2 *2* , deduced by gating on 186γ.
678.8 *2*	22 *1*	5932.3	$16^{(-)}$	5253.5	$15^{(-)}$	M1	Mult.: DCO=1.2 *2* , deduced by gating on 186γ.
690.5 *3*	18.8 *11*	3165.9	$12^{(+)}$	2475.5	$11^{(+)}$	M1	Mult.: DCO=0.9 *1* , deduced by double gating on 83γ and 631γ.
718.8 *2*	38 *2*	2475.5	$11^{(+)}$	1756.8	$10^{(+)}$	M1	Mult.: DCO=1.0 *1* , deduced by double gating on 83γ and 631γ.
719.7 *3*	7.5 *9*	1396.8	$8^{(-)}$	676.98	$7^{(-)}$	(M1)	Mult.: DCO=1.1 *2* , deduced by gating on 186γ.
722.6 *4*	15.0 *11*	6093.8	(16^-)	5370.8	$15^{(-)}$		
766.4 *5*	8.4 *8*	6860.2	(17^-)	6093.8	(16^-)		
771.3 *12*	4.7 *8*	4165.7	$13^{(-)}$	3393.8	$11^{(-)}$		
838.2 *3*	20 *1*	4245.4		3407.2	(12^+)		
868.0 *14*	1.9 *2*	2935.7	$10^{(-)}$	2067.0	(9^-)		
911.0 *3*	10.7 *6*	7381.7	(18^-)	6470.7	$17^{(-)}$	(M1)	Mult.: DCO=1.2 *3* , deduced by gating on 186γ.
959.0 *3*	11.1 *9*	1661.3	(8^-)	701.7	$8^{(+)}$		
984.8 *5*	6.4 *6*	1661.3	(8^-)	676.98	$7^{(-)}$		
994.8 *5*	14.6 *11*	4713.7	$14^{(-)}$	3720.5	$12^{(-)}$		E_γ: poor fit. Level-energy difference=993.22.
1015.2 *3*	21 *1*	4800.4	$14^{(-)}$	3785.1	$13^{(-)}$	(M1)	Mult.: DCO=1.0 *2* , deduced by gating on 186γ.
1054.9 *2*	63 *3*	1756.8	$10^{(+)}$	701.7	$8^{(+)}$	E2	Mult.: DCO=1.6 *1* , deduced by gating on 83γ.
1063.8 *3*	7.9 *8*	2460.8	$9^{(-)}$	1396.8	$8^{(-)}$	(M1)	Mult.: DCO=0.8 *1* , deduced by gating on 186γ.
1095.3 *2*	58 *3*	2427.7	$10^{(+)}$	1332.6	$9^{(+)}$	(M1)	Mult.: DCO=0.89 *9* , deduced by double gating on 83γ and 631γ.
1158.2 *8*	5.3 *6*	2916.8	(11^+)	1756.8	$10^{(+)}$		
1169.0 *6*	12.4 *11*	1870.7	(9^+)	701.7	$8^{(+)}$		
1181.0 *3*	9.0 *6*	2935.7	$10^{(-)}$	1756.8	$10^{(+)}$		E_γ: poor fit. Level-energy difference=1178.9.
1205.4 *5*	13.9 *9*	5370.8	$15^{(-)}$	4165.7	$13^{(-)}$		
1227.1 *12*	1.7 *4*	2971.4	(9^-)	1744.2	(7^-)		
1239.1 *8*	6.2 *6*	4800.4	$14^{(-)}$	3560.1	$12^{(-)}$		
1252.6 *11*	3.4 *4*	3720.5	$12^{(-)}$	2468.2	(10^-)		
1274.0 *4*	6.9 *6*	2935.7	$10^{(-)}$	1661.3	(8^-)		
1278.2 *13*	2.1 *6*	1744.2	(7^-)	465.89	5^-		
1365.4 *5*	10.1 *9*	3027.2	$10^{(-)}$	1661.3	(8^-)		
1376.5 *3*	22 *1*	2709.6	$10^{(-)}$	1332.6	$9^{(+)}$	(E1)	Mult.: DCO=0.86 *9* , deduced by double gating on 83γ and 631γ.
1380.7 *5*	13.5 *9*	6093.8	(16^-)	4713.7	$14^{(-)}$		
1390.0 *5*	11.1 *8*	2067.0	(9^-)	676.98	$7^{(-)}$		
1408.8 *2*	50 *3*	3165.9	$12^{(+)}$	1756.8	$10^{(+)}$	E2	Mult.: DCO=1.6 *1* , deduced by double gating on 83γ and 631γ.

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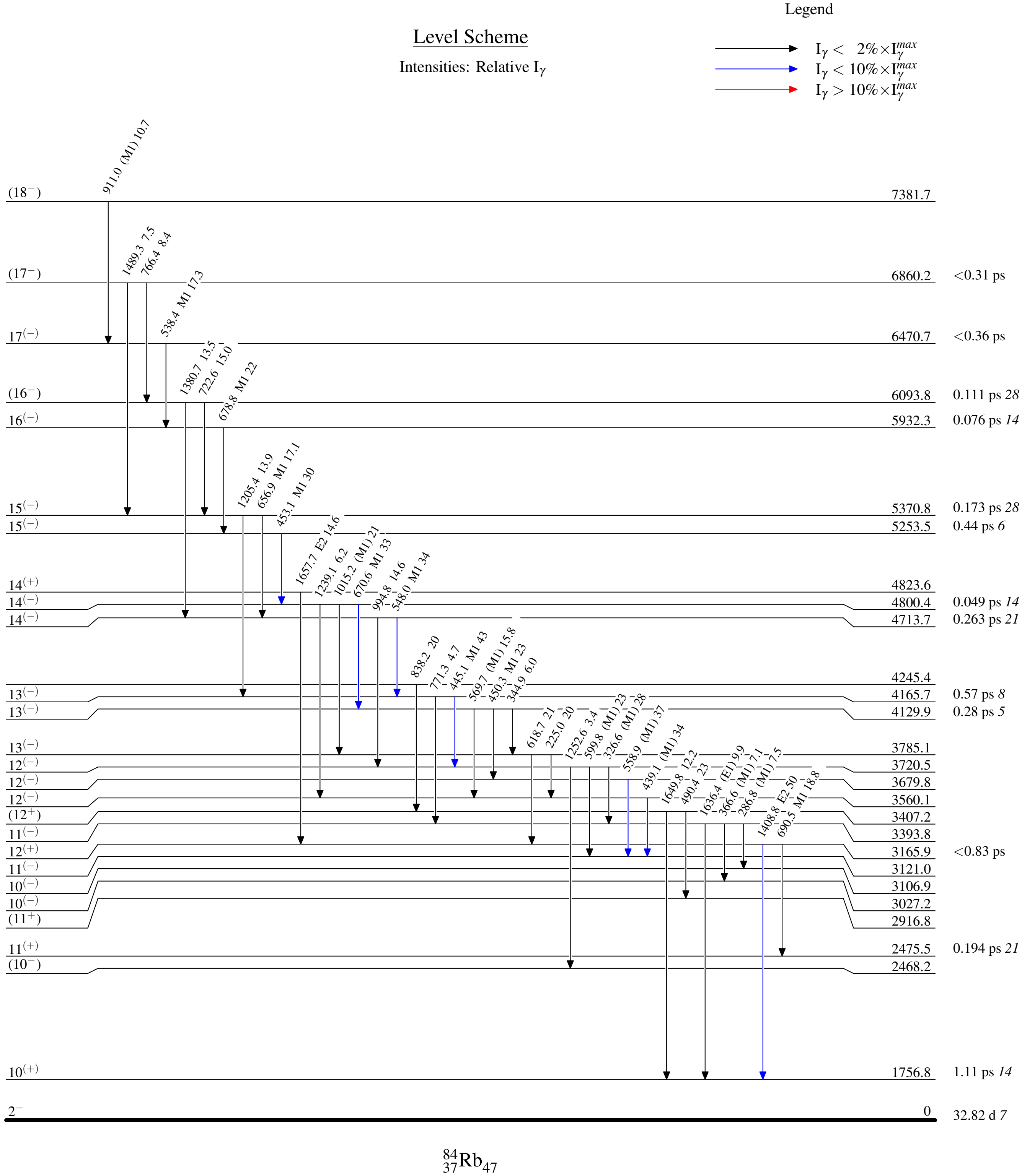
^{76}Ge(^{11}B,3nγ) 2002Sc35 (continued)

γ(^{84}Rb) (continued)

E_γ†	I_γ†	E_i(level)	J^π_i	E_f	J^π_f	Mult.†	Comments
1445.5 *15*	2.8 *4*	3106.9	$10^{(-)}$	1661.3	(8^-)		
1489.3 *9*	7.5 *8*	6860.2	(17^-)	5370.8	$15^{(-)}$		
1636.4 *4*	9.9 *8*	3393.8	$11^{(-)}$	1756.8	$10^{(+)}$	(E1)	Mult.: DCO=1.0 *2* , deduced by double gating on 83γ and 631γ.
1649.8 *6*	12.2 *8*	3407.2	(12^+)	1756.8	$10^{(+)}$		
1657.7 *5*	14.6 *11*	4823.6	$14^{(+)}$	3165.9	$12^{(+)}$	E2	Mult.: DCO=1.0 *3* , deduced by double gating on 1055γ and 1409γ.
1771.9 *9*	4.5 *4*	3106.9	$10^{(-)}$	1332.6	$9^{(+)}$		

† From 2002Sc35, unless otherwise specified. DCO ratios are based on gates of ΔJ=1 dipole transitions, unless otherwise stated.
‡ From adopted gammas (1991Do04).

^{76}Ge(^{11}B,3nγ) 2002Sc35



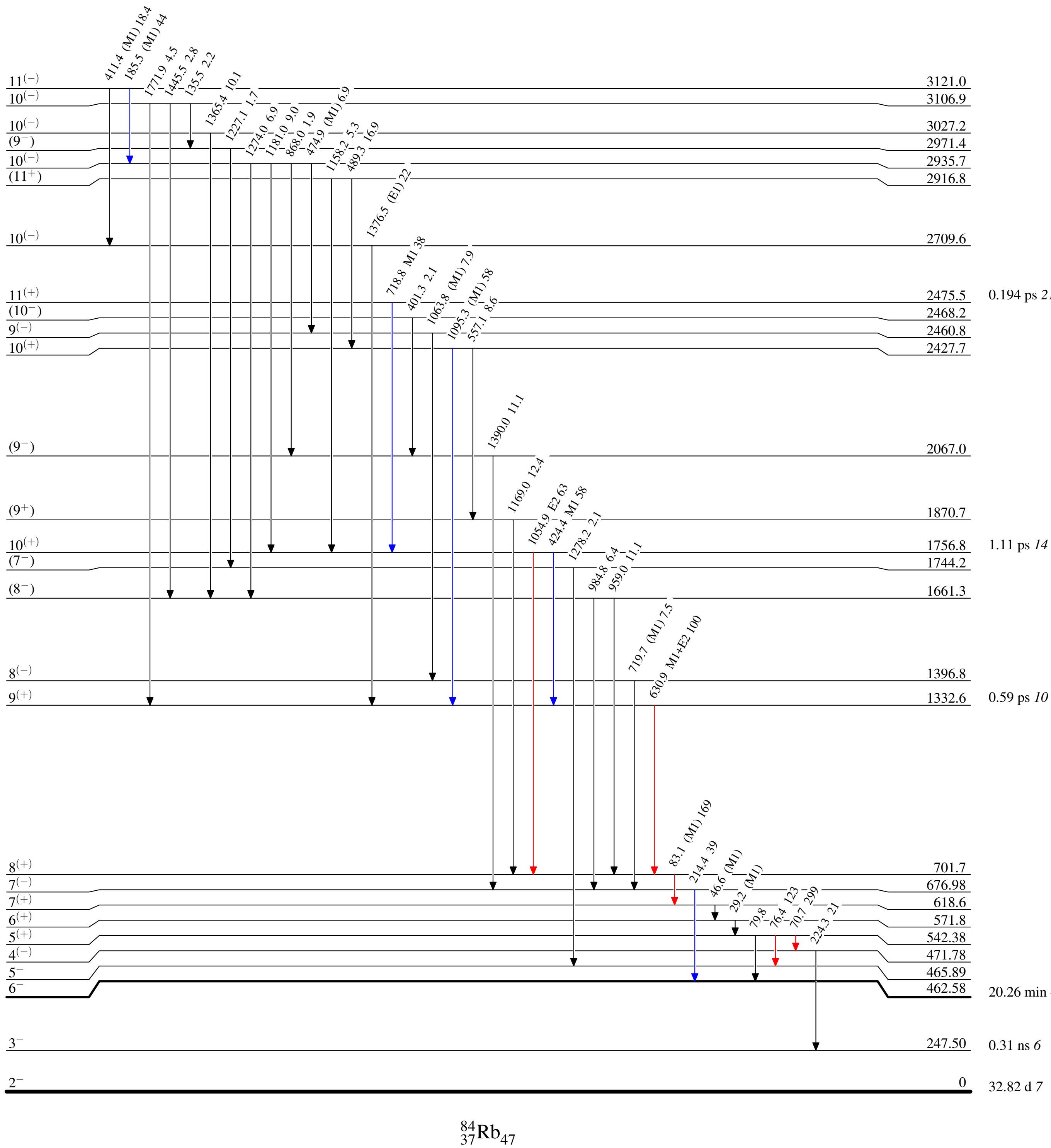
$^{76}Ge(^{11}B,3n\gamma)$ 2002Sc35

Level Scheme (continued)

Intensities: Relative I_γ

Legend

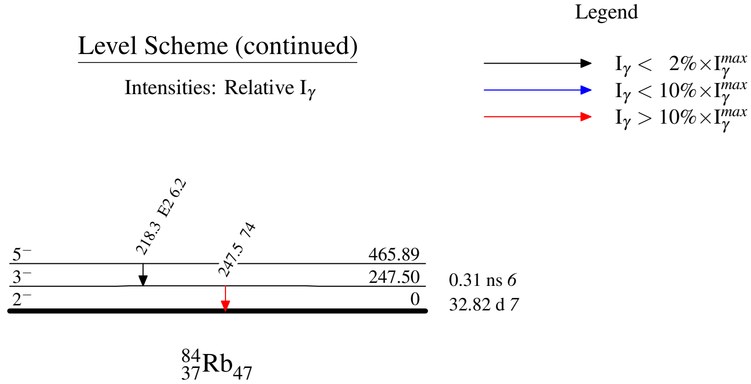
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



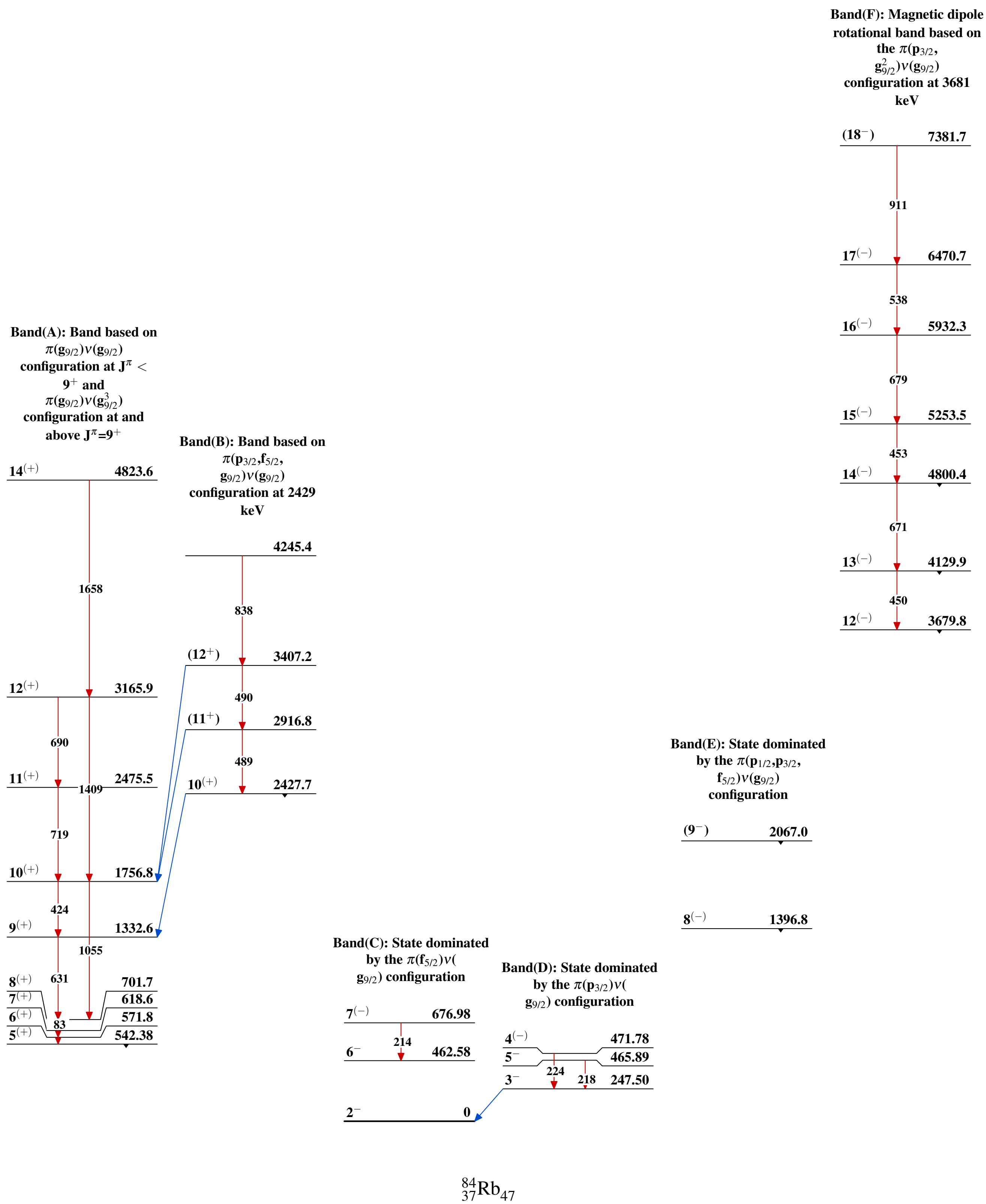
$^{76}Ge(^{11}B,3n\gamma)$ 2002Sc35

Level Scheme (continued)

Intensities: Relative I_γ

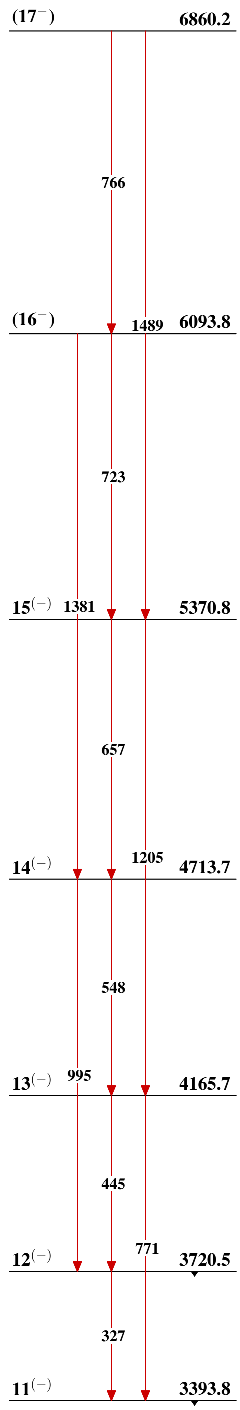


$^{76}Ge(^{11}B,3n\gamma)$ 2002Sc35



$^{76}Ge(^{11}B,3n\gamma)$ 2002Sc35 (continued)

Band(G): Magnetic dipole rotational band based on the $\pi(p_{3/2}, g^2_{9/2})\nu(g_{9/2})$ configuration at 3395 keV



$^{84}_{37}Rb_{47}$