^{65}Cu(^{36}S,p4nγ) 1998Kh01,2000Kh02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. Abriola(a), A. A. Sonzogni	NDS 109, 2501 (2008)	1-Apr-2008

1998Kh01: E=142 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$ Directional correlation ratios (DCO) using GAMMASPHERE array with 36 Compton-suppressed Ge detectors.

2000Kh02: E=142 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$ using 12 Compton-suppressed Ge detectors as well as using a plunger to measured half-lives.

Other: 1993Re02.

^{96}Ru Levels

E(level)[&]	J$^\pi$[a]	T$_{1/2}$[†]	E(level)[&]	J$^\pi$[a]	T$_{1/2}$[†]	E(level)[&]	J$^\pi$[a]
0.0[‡]	0$^+$		5752.9[#] *8*	13$^{(-)}$	2.1 ps *4*	8973.4 *14*	(18$^+$)
831.6[‡] *4*	2$^+$	3.5 ps *3*	5982.2[@] *9*	(14$^+$)		9105.6 *14*	(18$^+$)
1516.7[‡] *6*	4$^+$	6.8 ps *7*	6281.5 *8*	14$^{(-)}$		9253.4 *10*	(18$^-$)
2148.9[‡] *7*	6$^+$	12.7 ps *10*	6446.2[‡] *9*	(16$^+$)	≤7.4 ps	9253.5 *10*	(20$^+$)
2587.7[#] *7*	5$^{(-)}$		6683.5 *10*			9394.5[#] *9*	(19$^-$)
2950.3[‡] *7*	8$^+$	9.5 ps *8*	6757.1[#] *9*	15$^{(-)}$		9589.9 *10*	(20$^+$)
3172.6 *8*	(9$^+$)		6774.4 *10*			9668.6 *10*	(19$^-$)
3291.4[#] *7*	7$^{(-)}$	7.1 ps *9*	6780.4 *9*	16$^{(-)}$		9716.9 *10*	(19$^+$)
3818.7[‡] *8*	10$^+$	3.5 ps *4*	7419.6 *10*	(17$^+$)		9856.8 *14*	(20$^+$)
3930.3[@] *9*	(10$^+$)		7429.3 *9*	(16$^+$)		9895.6 *11*	(21$^-$)
3951.7[#] *7*	9$^{(-)}$	8.3 ps *8*	7539.4 *10*	(17$^+$)		9995.5[#] *10*	(21$^-$)
4267.1[@] *9*	(11$^+$)		7561.6 *9*	17$^{(-)}$		10001.8 *11*	(21$^+$)
4420.9[‡] *8*	(12$^+$)	21 ps *3*	7954.3[#] *9*	17$^{(-)}$	≤4.2 ps	10597.2 *12*	(22$^+$)
4535.3 *8*	10$^-$		8192.2 *13*	(17$^+$)		10635.8 *11*	(22$^+$)
4713.3[@] *8*	(12$^+$)		8210.2[‡] *10*	(18$^+$)		10723.9 *11*	(22$^+$)
4800.3[#] *8*	11$^{(-)}$	2.6 ps *5*	8239.4 *9*	18$^{(-)}$		11070.5 *14*	(22$^+$)
5534.7[@] *8*	(13$^+$)		8504.2 *13*	(17$^+$)		11364.5 *14*	(22$^+$)
5535.2 *8*	(12$^-$)		8648.7 *10*	(18$^+$)		11604.6[#] *14*	(23$^-$)
5684.5[‡] *8*	(14$^+$)	2.43 ps *21*	8739.6 *10*	(18$^+$)			

[†] From RDDS (2000Kh02).
[‡] Band(A): g.s. cascade.
[#] Band(B): 5$^-$ cascade.
[@] Band(C): (10$^+$) cascade.
[&] From least-squares fit to Eγ.
[a] As given by 1998Kh01, based on Mγ, band structures.

γ(^{96}Ru)

E$_\gamma$	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[‡]	Comments
112.1 *4*	2.0 *4*	3930.3	(10$^+$)	3818.7	10$^+$		
150.2 *4*	1.5 *4*	5684.5	(14$^+$)	5535.2	(12$^-$)		
217.7 *4*	6.0 *10*	5752.9	13$^{(-)}$	5534.7	(13$^+$)	D	DCO=1.6 *2*.
222.7 *4*	1.0 *4*	3172.6	(9$^+$)	2950.3	8$^+$	D	DCO=1.5 *3*.
227.0 *4*	1.2 *3*	9895.6	(21$^-$)	9668.6	(19$^-$)		
237.3 *4*	≤1	6683.5		6446.2	(16$^+$)		

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^{65}Cu(^{36}S,p4nγ) 1998Kh01,2000Kh02 (continued)

$\gamma(^{96}Ru)$ (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
265.1 *4*	1.0 *3*	4800.3	$11^{(-)}$	4535.3	10^-	D	DCO=1.5 *3*.
292.7 *4*	1.0 *3*	4713.3	(12^+)	4420.9	(12^+)		
328.2 *4*	≤1	6774.4		6446.2	(16^+)		
337.2 *4*	1.2 *4*	4267.1	(11^+)	3930.3	(10^+)		
446.7 *4*	1.4 *4*	4713.3	(12^+)	4267.1	(11^+)		
447.0 *4*	1.0 *4*	5982.2	(14^+)	5535.2	(12^-)		
475.6 *4*	17.6	6757.1	$15^{(-)}$	6281.5	$14^{(-)}$		DCO=1.6 *2*.
499.4 *4*	17.8	6780.4	$16^{(-)}$	6281.5	$14^{(-)}$	Q	DCO=2.2 *2*.
501.0 *4*	1.0 *5*	8739.6	(18^+)	8239.4	$18^{(-)}$		
528.8 *4*	15.0	6281.5	$14^{(-)}$	5752.9	$13^{(-)}$	D	DCO=1.6 *2*.
584.1 *4*	28.0	4535.3	10^-	3951.7	$9^{(-)}$	D	DCO=1.6 *2*.
595.4 *4*	1.0 *2*	10597.2	(22^+)	10001.8	(21^+)		
597.2 *4*	5.0 *8*	6281.5	$14^{(-)}$	5684.5	(14^+)	Q	DCO=3.1 *3*.
601.0 *4*	10.1	9995.5	(21^-)	9394.5	(19^-)	Q	DCO=1.9 *2*.
601.3 *4*	47.0	4420.9	(12^+)	3818.7	10^+	E2	DCO=1.8 *2*.
601.4 *4*	1.0 *4*	9105.6	(18^+)	8504.2	(17^+)	D	DCO=1.5 *3*.
632.1 *4*	85.0	2148.9	6^+	1516.7	4^+	E2	DCO=1.9 *2*.
660.4 *4*	63.0	3951.7	$9^{(-)}$	3291.4	$7^{(-)}$	E2	DCO=2.0 *2*.
677.9 *4*	16.8	8239.4	$18^{(-)}$	7561.6	$17^{(-)}$		DCO=1.5 *3*.
685.1 *4*	96.0	1516.7	4^+	831.6	2^+	E2	DCO=1.9 *2*. E_γ: measured value in this dataset is about 0.4 keV below adopted value.
703.9 *4*	58.0	3291.4	$7^{(-)}$	2587.7	$5^{(-)}$	E2	DCO=2.0 *2*.
735.2 *4*	8.4	5535.2	(12^-)	4800.3	$11^{(-)}$		DCO=1.5 *2*.
746.5 *4*	5.0	6281.5	$14^{(-)}$	5534.7	(13^+)	Q	DCO=2.0 *3*.
748.3 *4*	1.8 *4*	10001.8	(21^+)	9253.5	(20^+)	D	DCO=1.6 *3*.
751.2 *4*	1.0 *5*	9856.8	(20^+)	9105.6	(18^+)		
761.1 *4*	12.0	6446.2	(16^+)	5684.5	(14^+)	E2	DCO=2.2 *2*.
779.4 *4*	1.1 *6*	3951.7	$9^{(-)}$	3172.6	(9^+)		
780.8 *4*	1.0 *5*	8210.2	(18^+)	7429.3	(16^+)		
781.2 *4*	≤1	8973.4	(18^+)	8192.2	(17^+)		
781.4 *4*	21.1	7561.6	$17^{(-)}$	6780.4	$16^{(-)}$		DCO=1.5 *2*.
801.2 *4*	67.2	2950.3	8^+	2148.9	6^+	E2	DCO=2.1 *2*.
822.0 *4*	2.0 *6*	5534.7	(13^+)	4713.3	(12^+)	D	DCO=1.5 *3*.
831.6 *4*	100.0	831.6	2^+	0.0	0^+	E2	DCO=1.8 *1*. E_γ: measured value in this dataset is about 1 keV below adopted value.
849.2 *4*	50.0	4800.3	$11^{(-)}$	3951.7	$9^{(-)}$		
850.2 *4*	1.0 *3*	9589.9	(20^+)	8739.6	(18^+)	Q	DCO=2.1 *3*.
867.3 *4*	57.0	3818.7	10^+	2950.3	8^+	E2	DCO=2.2 *1*.
893.9 *4*	1.1 *4*	4713.3	(12^+)	3818.7	10^+		
952.9 *4*	36.1	5752.9	$13^{(-)}$	4800.3	$11^{(-)}$	E2	DCO=2.0 *2*.
973.4 *4*	1.0 *5*	7419.6	(17^+)	6446.2	(16^+)		
977.2 *4*	≤1	9716.9	(19^+)	8739.6	(18^+)		
1000.3 *4*	19.0	5535.2	(12^-)	4535.3	10^-	Q	DCO=1.9 *2*.
1002.1 *4*	1.0 *3*	3951.7	$9^{(-)}$	2950.3	8^+		
1004.4 *4*	26.9	6757.1	$15^{(-)}$	5752.9	$13^{(-)}$	E2	DCO=2.1 *2*.
1043.3 *4*	2.0 *6*	9253.5	(20^+)	8210.2	(18^+)	Q	DCO=1.8 *3*.
1071.1 *4*	47.0	2587.7	$5^{(-)}$	1516.7	4^+	D	DCO=1.3 *3*.
1093.2 *4*	1.0 *4*	7539.4	(17^+)	6446.2	(16^+)		
1134.0 *4*	1.3 *3*	10723.9	(22^+)	9589.9	(20^+)	Q	DCO=2.0 *3*.
1155.0 *4*	10.0	9394.5	(19^-)	8239.4	$18^{(-)}$		
1197.4 *4*	26.0	7954.3	$17^{(-)}$	6757.1	$15^{(-)}$	E2	DCO=1.9 *2*.
1229.1 *4*	≤1	8648.7	(18^+)	7419.6	(17^+)		

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^{65}Cu(^{36}S,p4nγ) 1998Kh01,2000Kh02 (continued)

$\gamma(^{96}Ru)$ (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
1262.3 *4*	25.0	5684.5	(14^+)	4420.9	(12^+)	E2	DCO=2.0 *2*.
1299.1 *4*	1.0 *5*	9253.4	(18^-)	7954.3	$17^{(-)}$		
1382.4 *4*	≤1	10635.8	(22^+)	9253.4	(18^-)		
1429.2 *4*	1.0 *3*	9668.6	(19^-)	8239.4	$18^{(-)}$	D	DCO=1.6 *3*.
1440.4 *4*	5.0 *10*	9394.5	(19^-)	7954.3	$17^{(-)}$	E2	DCO=1.9 *3*.
1447.0 *4*	1.0 *5*	7429.3	(16^+)	5982.2	(14^+)		
1459.3 *4*	1.0 *6*	8239.4	$18^{(-)}$	6780.4	$16^{(-)}$		
1609 *1*	1.0 *4*	11604.6	(23^-)	9995.5	(21^-)	Q	DCO=2.1 *3*.
1744 *1*	1.0 *4*	7429.3	(16^+)	5684.5	(14^+)		
1746 *1*	1.0 *4*	8192.2	(17^+)	6446.2	(16^+)		
1765 *1*	3.5 *8*	8210.2	(18^+)	6446.2	(16^+)	E2	DCO=1.8 *3*.
1817 *1*	≤1	11070.5	(22^+)	9253.4	(18^-)		
2058 *1*	1.0 *2*	8504.2	(17^+)	6446.2	(16^+)		
2111 *1*	≤1	11364.5	(22^+)	9253.4	(18^-)		
2289 *1*	1.0 *2*	8739.6	(18^+)	6446.2	(16^+)		

[†] $\Delta(I\gamma)$ is <10% when not given.
[‡] From DCO values and band structure.

^{65}Cu(^{36}S,p4nγ) 1998Kh01,2000Kh02

Level Scheme

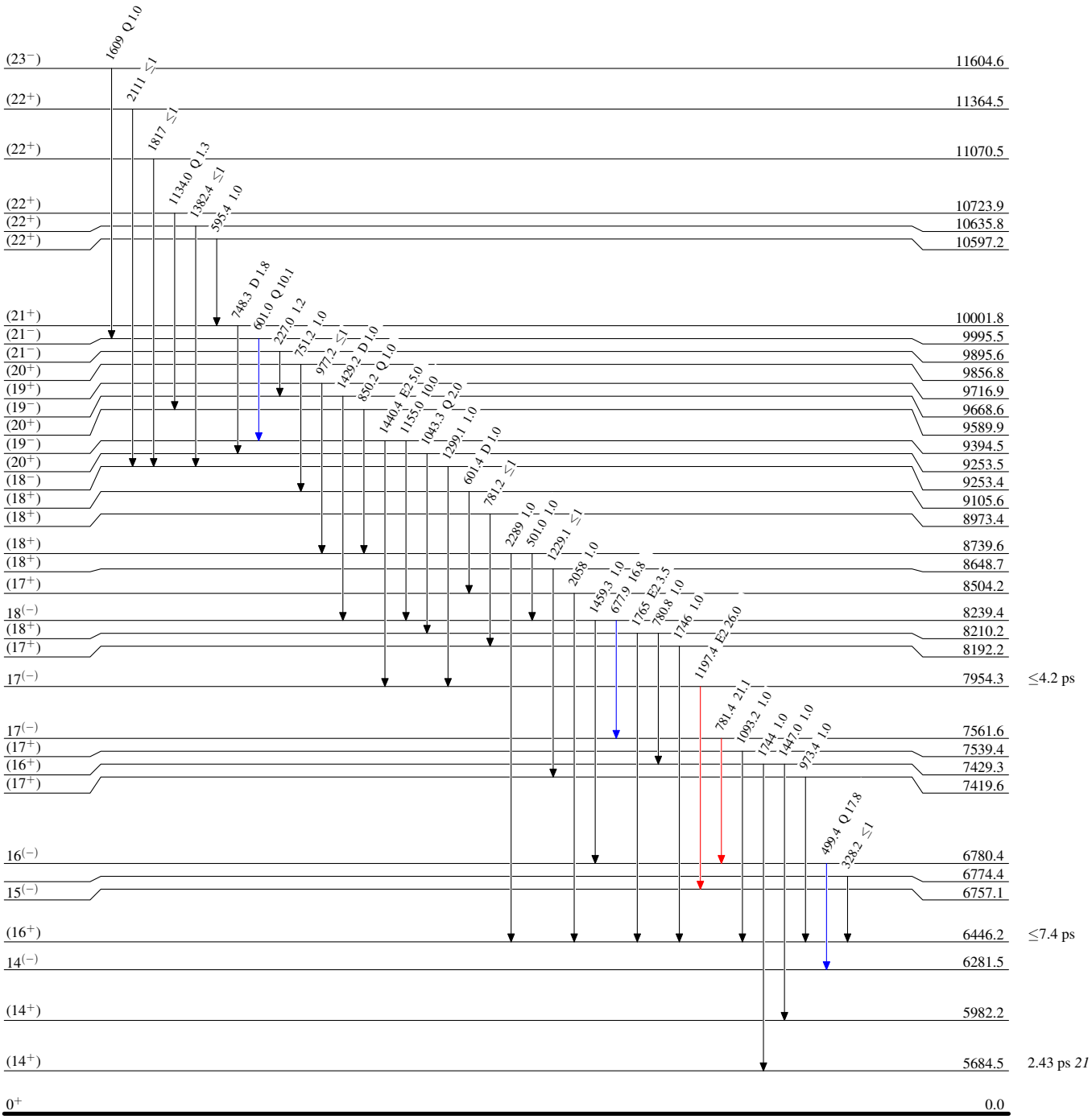
Intensities: Relative I_γ

Legend

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

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

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

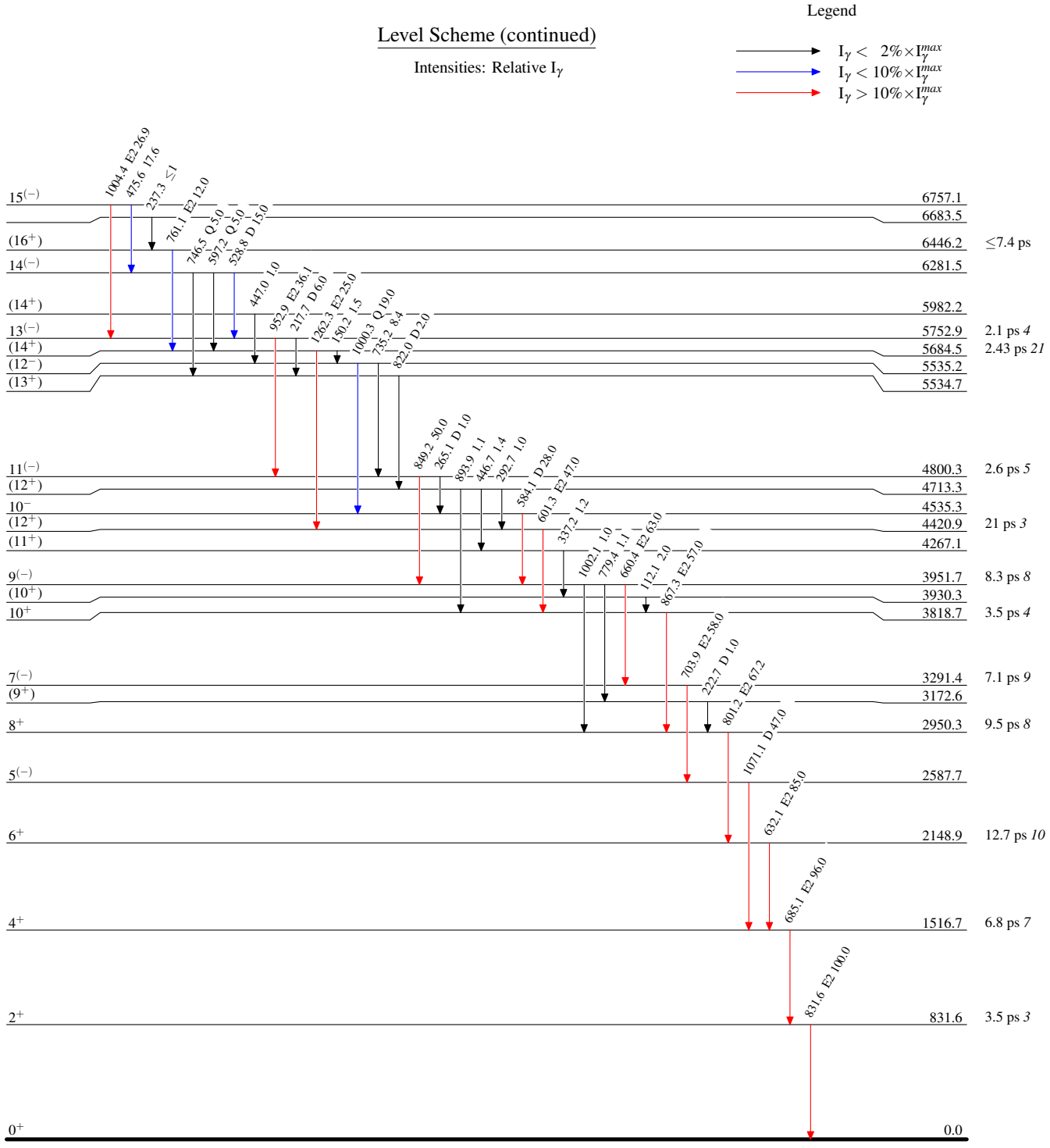


$^{96}_{44}Ru_{52}$

^{65}Cu(^{36}S,p4nγ) 1998Kh01,2000Kh02

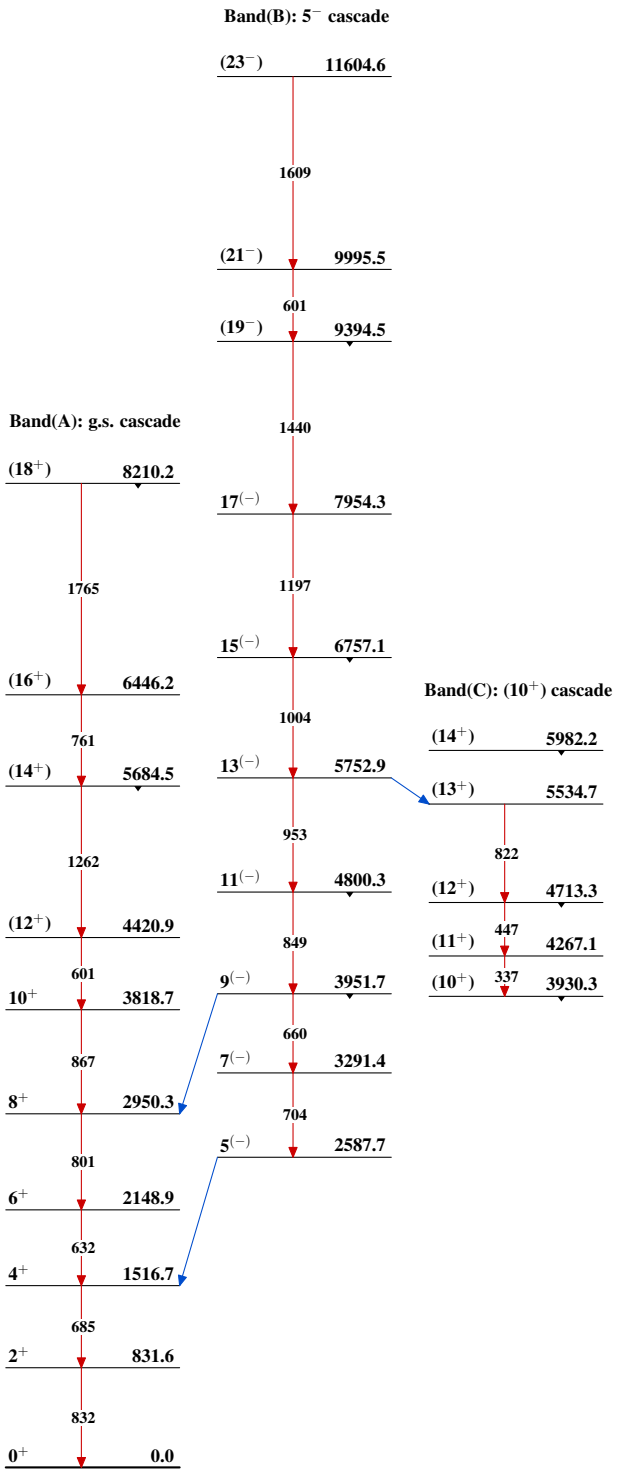
Level Scheme (continued)

Intensities: Relative I_γ



$^{96}_{44}Ru_{52}$

$^{65}Cu(^{36}S,p4n\gamma)$ 1998Kh01,2000Kh02



$^{96}_{44}Ru_{52}$