^{53}Cr(n,γ),(pol n,γ) E=th 1989Ho15,1988Li30,2004Be01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yang Dong, Huo Junde	NDS 121, 1 (2014)	20-Jun-2014

1989Ho15: E=thermal, measured Eγ, Iγ, pair spectrometer.
1988Li30: measured mean $T_{1/2}$, DSAM.
1989Co01: measured $\gamma\gamma(\theta)$.
1991KoZY: E=thermal, measured DSAM.
1992Ku17: E=thermal, measured $T_{1/2}$. Molecular dynamics simulations applied to the determination of nuclear lifetimes from Doppler- broadened γ-ray line shapes.
1972Lo26: E=thermal, measured Iγ, internal target facility, Ge(Li) annihilation-pair spectrometer.
1971Kn06: polarized slow neutrons, natural target, Ge(Li).
1968Wh03: measured Eγ, Ge(Li) three-crystal pair spectrometer.
1997Ve03: E=thermal, measured Iγ, a Ge(Li) and two NaI(Tl) pair spectrometer.
2004Be01: E=cold, natural target, measured Iγ, HPGE-BGO Compton- suppressed spectrometer.
Other: see 1978Ve02.
Level scheme from 1989Ho15.

^{54}Cr Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[#]	Comments
0.0	0^+		
834.879 *19*	2^+		
1823.96 *3*	4^+		
2619.69 *4*	2^+	78 fs *15*	$T_{1/2}$: other: 118 fs *21*, 215 fs *62* (1988Li30).
2829.56 *4*	0^+		
3074.06 *5*	2^+	7.1 fs *4*	$T_{1/2}$: others: 9.0 fs *14* (1988Li30), 2.1 fs *10* (1991Ko44).
3159.21 *6*	4^+		
3393.42 *4*	2^+	15[@] fs *+14−7*	
3436.88 *5*	2^+	8[@] fs *3*	
3656.1 *5*	4^+		
3719.99 *4*	2^+	16.6 fs *14*	$T_{1/2}$: others: 21 fs *3* (1988Li30), 9 fs *+7−4* (1991Ko44).
3861.02 *5*	2^+		
3925.59 *7*	2^+		
3927.70 *8*	2^+		
4012.87 *7*	0^+	1.4[@] fs *+21−14*	
4083.24 *5*	3^+		
4127.08 *7*	3^-		
4217.56 *4*	$(2^+),3^+$		
4380.74 *9*	2^-		
4633.57 *10*	2^+		
4872.36 *5*	2^+		
5189.62 *10*	2^+		
5226.22 *8*	2^+		
5268.47 *9*	2^+		
5294.47 *8*	$1^+,(2^+)$		
5586.92 *6*	$1^+,2^+$		
5821.49 *10*			
5856.39 *11*			
6143.59 *9*			
6316.42 *7*			
(9720.18 *4*)	(1^-)		

[†] For states connected by γ-transitions calculated by using least-squares adjustment procedures.

Continued on next page (footnotes at end of table)

^{53}Cr(n,γ),(pol n,γ) E=th 1989Ho15,1988Li30,2004Be01 (continued)

^{54}Cr Levels (continued)

‡ From (pol n,γ) and $\gamma\gamma(\theta)$ measurements.
# From 1992Ku17, except as noted.
@ From 1991Ko44.

$\gamma(^{54}Cr)$

$\gamma\gamma$: 1962Ka05, 1963Wh02, 1965Ba12, 1967Bo21.
$\gamma\gamma(\theta)$: 1956Tr33, 1963Wh02, 1965Ba12.

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.@	δ@	Comments
205.62 *20*	0.05 *1*	3925.59	2^+	3719.99	2^+			
745.37 *16*	0.06 *1*	4872.36	2^+	4127.08	3^-			
x789.22 *2*	0.07 *1*							
817.20 *7*	0.07 *1*	3436.88	2^+	2619.69	2^+			
834.87 *2*	79.0# *2*	834.879	2^+	0.0	0^+			
845.57 *12*	0.17 *2*	5226.22	2^+	4380.74	2^-			
847.90 *17*	0.08 *1*	6143.59		5294.47	$1^+,(2^+)$			
890.41 *2*	0.43 *3*	3719.99	2^+	2829.56	0^+			
944.57 *19*	0.03 *1*	4872.36	2^+	3927.70	2^+			
946.80 *15*	0.05 *1*	4872.36	2^+	3925.59	2^+			
989.08 *2*	0.76 *5*	1823.96	4^+	834.879	2^+	E2		Coincident with 834.861γ.
1100.38 *6*	0.64 *4*	3719.99	2^+	2619.69	2^+			
1106.38 *10*	0.02 *1*	5189.62	2^+	4083.24	3^+			
x1205.33 *10*	0.05 *1*							
1241.36 *7*	0.78 *5*	3861.02	2^+	2619.69	2^+			
1335.26 *6*	0.06 *1*	3159.21	4^+	1823.96	4^+			
1340.81 *10*	0.12 *2*	5268.47	2^+	3927.70	2^+			
1435.49 *18*	0.23 *2*	4872.36	2^+	3436.88	2^+			
1460.10 *14*	0.04 *2*	5586.92	$1^+,2^+$	4127.08	3^-			
1463.33 *14*	0.07 *2*	4083.24	3^+	2619.69	2^+			
1503.62 *9*	0.06 *2*	5586.92	$1^+,2^+$	4083.24	3^+			
1508.24 *25*	0.06 *2*	4127.08	3^-	2619.69	2^+			
1597.72 *4*	0.03 *2*	4217.56	$(2^+),3^+$	2619.69	2^+			
x1619.17 *7*	0.09 *2*							
1784.69 *5*	10.14# *4*	2619.69	2^+	834.879	2^+	M1+E2	−0.53 *18*	
1798.22 *5*	0.25 *2*	4872.36	2^+	3074.06	2^+			
1804.00 *14*	0.24 *2*	4633.57	2^+	2829.56	0^+			
1831.34 *17*	0.03 *2*	5268.47	2^+	3436.88	2^+			
1994.56 *5*	2.93 *15*	2829.56	0^+	834.879	2^+	E2		
2066.99 *7*	0.04 *2*	5226.22	2^+	3159.21	4^+			
2101.43 *12*	0.10 *2*	5821.49		3719.99	2^+			
2233.09 *6*	0.07 *3*	6316.42		4083.24	3^+			
2239.07 *5*	10.70# *5*	3074.06	2^+	834.879	2^+	M1+E2	0.02 *5*	
2259.22 *5*	0.21 *2*	4083.24	3^+	1823.96	4^+			
2393.70 *7*	0.10 *2*	4217.56	$(2^+),3^+$	1823.96	4^+			
2464.23 *19*	0.09 *3*	5294.47	$1^+,(2^+)$	2829.56	0^+			
2558.45 *5*	1.15 *7*	3393.42	2^+	834.879	2^+			
2601.91 *8*	2.31 *13*	3436.88	2^+	834.879	2^+	M1+E2	−0.11 *+12−16*	
2619.57 *9*	0.42 *3*	2619.69	2^+	0.0	0^+			
2674.49 *11*	0.20 *2*	5294.47	$1^+,(2^+)$	2619.69	2^+			
2749.56 *36*	0.05 *2*	6143.59		3393.42	2^+			
x2946.36 *14*	0.10 *3*							
2967.05 *19*	0.17 *3*	5586.92	$1^+,2^+$	2619.69	2^+			

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^{53}Cr(n,γ),(pol n,γ) E=th 1989Ho15,1988Li30,2004Be01 (continued)

γ(^{54}Cr) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [@]	Comments
3026.05 *6*	0.47 *4*	3861.02	2^+	834.879	2^+		
3073.95 *18*	0.12 *2*	3074.06	2^+	0.0	0^+		
3090.63 *8*	0.30 *5*	3925.59	2^+	834.879	2^+		
3177.93 *7*	1.40 *8*	4012.87	0^+	834.879	2^+		
3292.11 *8*	0.13 *3*	4127.08	3^-	834.879	2^+		
[x]3303.51 *23*	0.05 *2*						
3382.81 *8*	0.11 *3*	4217.56	$(2^+),3^+$	834.879	2^+		
3393.35 *7*	0.67 *6*	3393.42	2^+	0.0	0^+		δ: δ>8.7 or δ=−0.25 *+20−16* if J=3; δ=0.01 if J=1 (1989Co01).
3403.55 *9*	0.17 *7*	(9720.18)	(1^-)	6316.42			
[x]3509.86 *17*	0.21 *2*						
3545.92 *13*	0.32 *4*	4380.74	2^-	834.879	2^+		
3576.08 *9*	0.20 *4*	(9720.18)	(1^-)	6143.59			
3719.84 *7*	3.69[#] *2*	3719.99	2^+	0.0	0^+		
3863.64 *11*	0.39 *5*	(9720.18)	(1^-)	5856.39			
3898.51 *14*	0.11 *2*	(9720.18)	(1^-)	5821.49			
3927.57 *9*	0.52 *7*	3927.70	2^+	0.0	0^+		
4133.15 *8*	0.48 *5*	(9720.18)	(1^-)	5586.92	$1^+,2^+$		
[x]4168.1 *6*	0.12 *4*						
[x]4229.9 *3*	0.10 *4*						
[x]4393.28 *9*	0.06 *4*						
4425.63 *16*	0.50 *6*	(9720.18)	(1^-)	5294.47	$1^+,(2^+)$		
4433.43 *21*	0.20 *3*	5268.47	2^+	834.879	2^+		
4451.47 *18*	0.45 *5*	(9720.18)	(1^-)	5268.47	2^+		
4459.28 *21*	0.38 *5*	5294.47	$1^+,(2^+)$	834.879	2^+		
4494.00 *14*	0.13 *5*	(9720.18)	(1^-)	5226.22	2^+		
4530.38 *21*	0.19 *5*	(9720.18)	(1^-)	5189.62	2^+		
4751.83 *10*	0.18 *4*	5586.92	$1^+,2^+$	834.879	2^+		
4847.54 *11*	1.96 *7*	(9720.18)	(1^-)	4872.36	2^+		
4872.27 *10*	1.06 *8*	4872.36	2^+	0.0	0^+		
5021.29 *34*	0.16 *6*	5856.39		834.879	2^+		
5086.36 *12*	0.23 *6*	(9720.18)	(1^-)	4633.57	2^+		
5339.27 *18*	0.29 *4*	(9720.18)	(1^-)	4380.74	2^-		
5501.78 *26*	0.13 *2*	(9720.18)	(1^-)	4217.56	$(2^+),3^+$		
5636.90 *42*	0.13 *3*	(9720.18)	(1^-)	4083.24	3^+		
5707.09 *12*	1.35 *11*	(9720.18)	(1^-)	4012.87	0^+		
5792.2 *6*	0.46 *7*	(9720.18)	(1^-)	3927.70	2^+		
5794.3 *4*	0.17 *5*	(9720.18)	(1^-)	3925.59	2^+		
5858.98 *14*	1.21 *8*	(9720.18)	(1^-)	3861.02	2^+		
5999.95 *13*	4.49[#] *4*	(9720.18)	(1^-)	3719.99	2^+	(E1)[&]	
6283.02 *14*	2.03 *14*	(9720.18)	(1^-)	3436.88	2^+		
6326.41 *14*	1.19 *12*	(9720.18)	(1^-)	3393.42	2^+		Coincident with 1784.66γ and 2239.07γ.
6645.64 *13*	9.71[#] *8*	(9720.18)	(1^-)	3074.06	2^+	(E1)[&]	
6890.16 *15*	2.35 *16*	(9720.18)	(1^-)	2829.56	0^+		
7100.11 *14*	7.61[#] *7*	(9720.18)	(1^-)	2619.69	2^+		
8884.81 *18*	44.4[#] *6*	(9720.18)	(1^-)	834.879	2^+	(E1)[&]	
9718.79 *19*	15.8[#] *2*	(9720.18)	(1^-)	0.0	0^+	(E1)[&]	

[†] From 1989Ho15, except as noted.

[‡] Photons per 100 n-captures in ^{53}Cr. From 1989Ho15 where available; except as noted. Values of 1972Lo26 are systematically higher than those of 1969Ra10. Both authors used natural targets.

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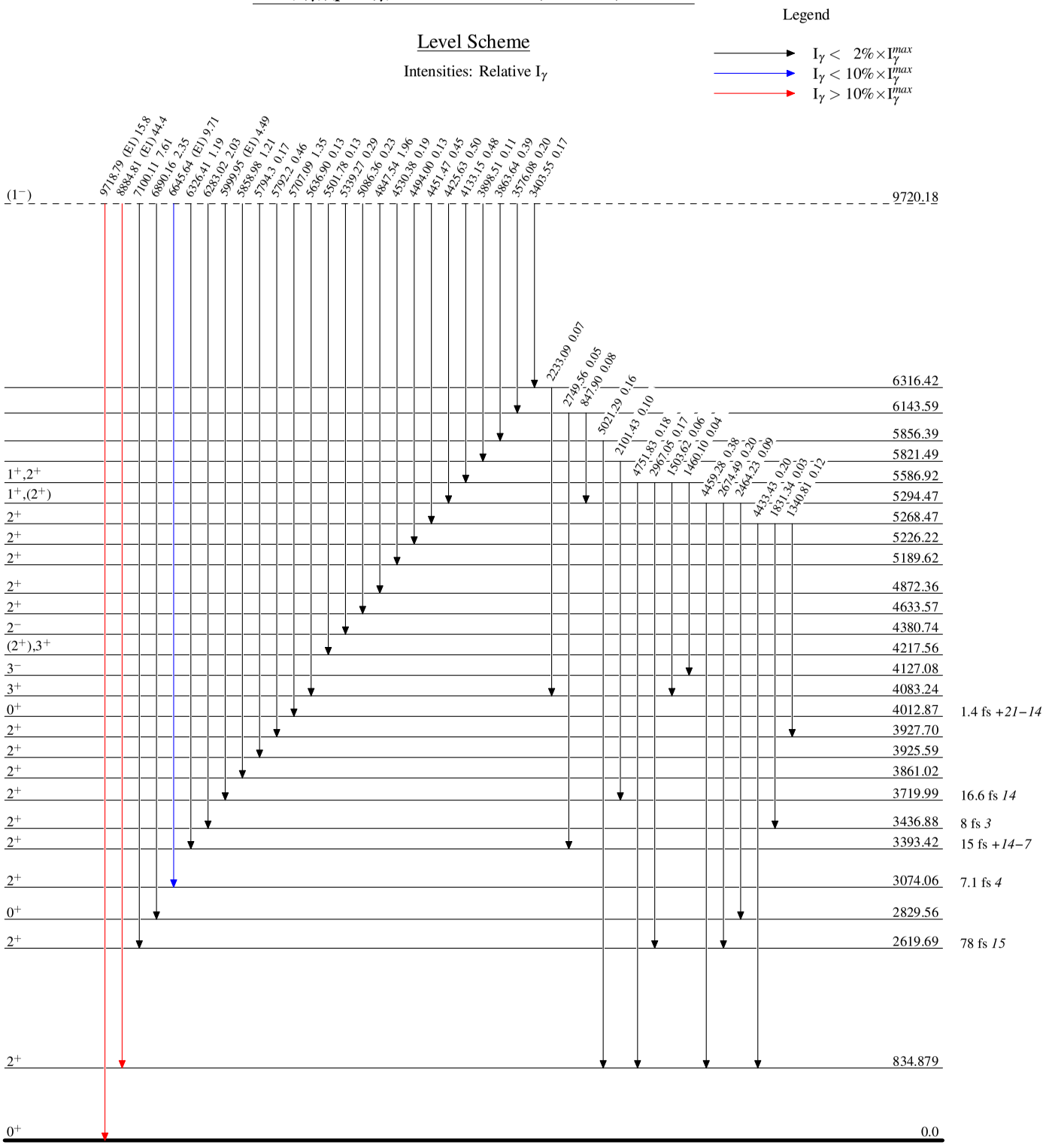
^{53}Cr(n,γ),(pol n,γ) E=th 1989Ho15,1988Li30,2004Be01 (continued)

γ(^{54}Cr) (continued)

[#] From 2004Be01.
[@] From 1989Co01, except as noted.
[&] From CP(γ) following (pol n,γ): 1971Kn06, 1956Tr33.
[x] γ ray not placed in level scheme.

^{53}Cr(n,γ),(pol n,γ) E=th 1989Ho15,1988Li30,2004Be01

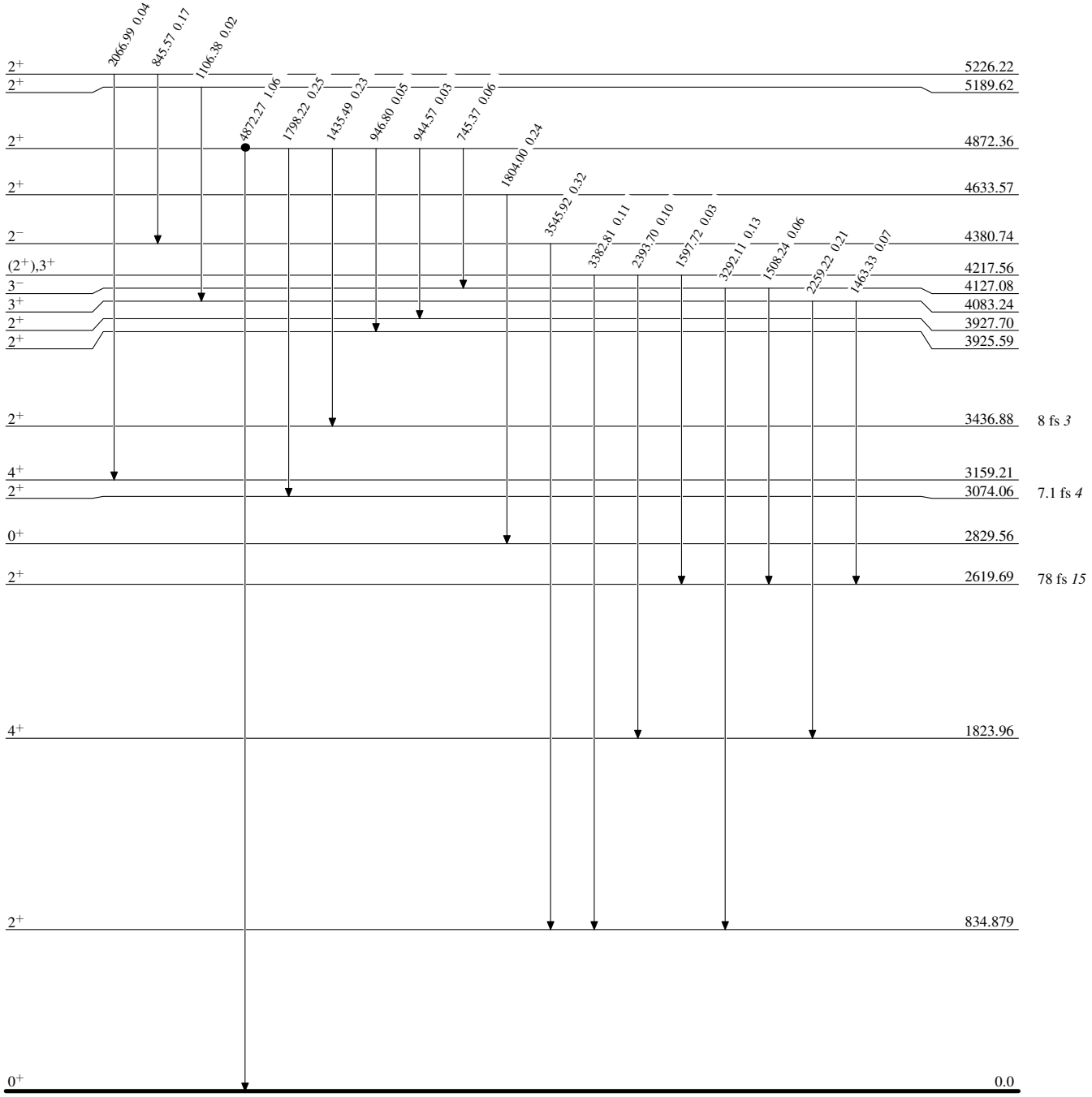


$^{54}_{24}Cr_{30}$

^{53}Cr(n,γ),(pol n,γ) E=th 1989Ho15,1988Li30,2004Be01

Level Scheme (continued)

Intensities: Relative I_γ

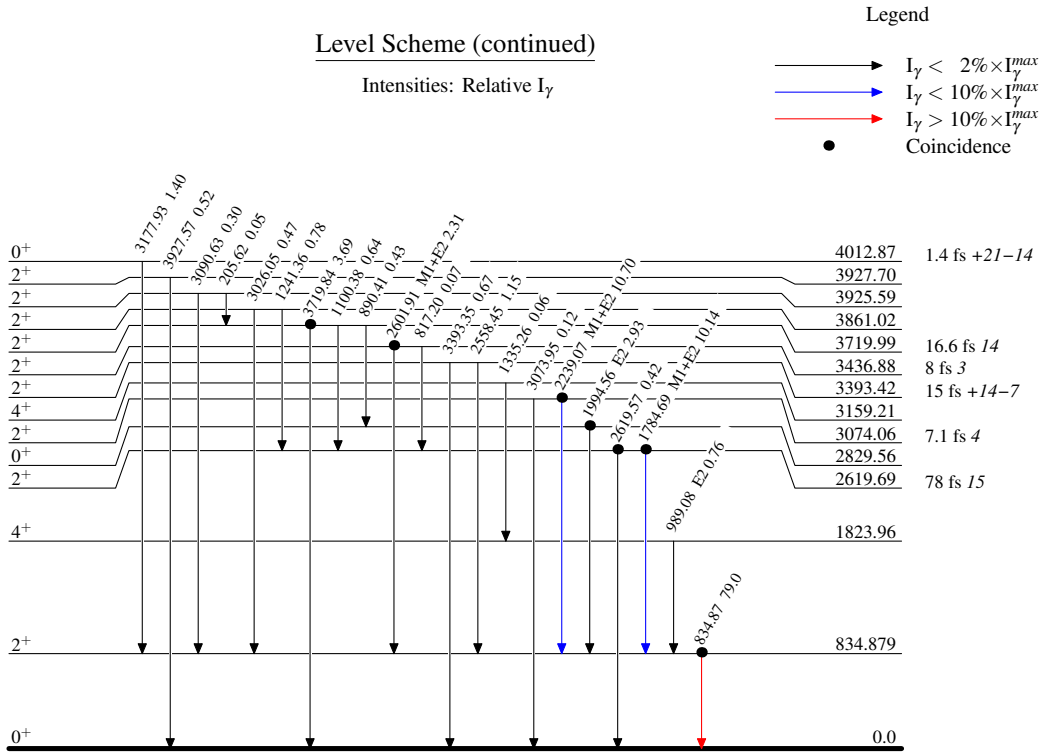


$^{54}_{24}Cr_{30}$

^{53}Cr(n,γ),(pol n,γ) E=th 1989Ho15,1988Li30,2004Be01

Level Scheme (continued)

Intensities: Relative I_γ



$^{54}_{24}Cr_{30}$