Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Wang Jimin and Huang Xiaolong	NDS 144,1 (2017)	1-Mar-2016

Q(β^-)=−3207.5 *3*; S(n)=9260.64 *20*; S(p)=9516.35 *23*; Q(α)=−8939.9 *4* 2017Wa10

Other Reactions:

^{48}Ti(α,n): 1989PeZY: E=9,11,13 MeV, measured $\sigma(\theta)$ θ=0°−150° in 25° steps. 1983Vo13: E=6-13 MeV, measured yield of residual nuclides; deduced total σ(Eα). Comparison with optical-model calculation. 1971Gr03: E=11.5-22.7 MeV, measured σ(Eα; E(n),θ), ^{51}Cr deduced level densities.

^{54}Fe(n,α): 1988Av04: E=14.8, 20 MeV; measured $\sigma(\theta)$; calculated σ with hybrid preequilibrium emission model. 1987SaZY: E=8 MeV; measured σ; Hauser-Feshbach analysis.

^{50}Cr(n,γ) E=Resonance (1986Br12): E=5-300 keV; measured capture and transmission data; deduced resonance parameters.

^{51}Cr Levels

IAS investigated in ^{51}V(^{3}He,t), ^{52}Cr(^{3}He,α) and ^{51}V(p,n).
For band configurations, see 1985Av04, 1980Ka10, and 1980Ah04.

Cross Reference (XREF) Flags

A	^{51}Mn ε decay	F	^{50}Cr(n,γ),(pol n,γ) E=thermal	K	^{52}Cr(^{3}He,α)
B	^{48}Ti(α,nγ)	G	^{50}Cr(d,p),(pol d,p)	L	^{52}Cr(γ,nγ')
C	^{49}Ti(^{3}He,n)	H	^{51}V(p,n)	M	^{52}Cr(n,2nγ)
D	(HI,xnγ)	I	^{51}V(p,nγ)		
E	^{50}V(^{3}He,d)	J	^{51}V(^{3}He,t)		

E(level)[†]	J$^\pi$[@]	$T_{1/2}$[‡]	XREF	Comments
0.0[g]	7/2$^-$	27.704 d *4*	ABCDEFGHI KLM	%ε=100 J$^\pi$: J from atomic beam (1976Fu06), L=3 in ^{50}V(^{3}He,d), ^{52}Cr(^{3}He,α) and ^{50}Cr(d,p). $T_{1/2}$: from weighted average of 27.70 d *3* (2014Un01), 27.710 d *30* (1976WaZH,1982DeYX,1983Wa26), 27.71 d *1* (1982ChZF), 27.690 d *5* (1980Ho17), 27.720 d *27* (1975La16), 27.703 d *8* (1974Ts01), 27.750 d *9* (1973Vi13), 27.76 d *15* (1972Em01), 27.704 d *3* (1969MeZV, 1970MeZQ, 1980RuZY), 27.80 d *51* (1968Bo25), 27.701 d *6* (1964Ma56), 27.82 d *20* (1963Ho17), 27.75 d *30* (1957Wr37), 27.8 d *1* (1956Sc87), 27.75 d *30* (1952Ly17). Others: 27.6999 d *13* (2012Fi12, superseded by 2014Un01), 27.7010 d *12* (2002Un02, superseded by 2014Un01), 27.7010 d *12* (1992Un01, superseded by 2014Un01), 27.73 d *1* (1982HoZJ, superseded by 2014Un01), 28.1 d *17* (omitted as outlier, 1973ArZI), 27.679 d *17* (1976WaZH, superseded by 1983Wa26), 27.7 d *2* (1967LaZZ, superseded by 1975La16), 27.5 (1965Sa09), 28.04 d *16*, 27.85 d *2* (omitted as outlier, 1957Ka65), 27.9 d *2* (omitted as outlier, 1956Ka33), 27 (1948Mi12), 26 (1948Ho04), 26.0 d *10*, 26.5 d *10* (omitted as outlier, 1940Wa023), 27.7009 d *20* (2004Wo02,evaluation). μ=(−)0.934 *5* (1970Ad07,1989Ra17,2014StZZ). μ: ^{53}Cr standard, Atomic Beam Magnetic Resonance (AB)(1970Ad07).
749.10[e] *8*	3/2$^-$	7.35 ns *3*	AB D FGHI KLM	μ=−0.86 *12* (1974Ko10,1989Ra17,2014StZZ) XREF: K(731). J$^\pi$: E2 γ to 7/2$^-$, L=1 in ^{52}Cr(^{3}He,α), ^{50}Cr(d,p). $T_{1/2}$: From ^{51}V(p,nγ). Others: 7.25 ns *25* in ^{48}Ti(α,nγ), 7.6 ns *3* in ^{51}Mn ε decay, 8.3 ns *19* in ^{52}Cr(n,2nγ). μ: From $\gamma(\theta$,H,t) in ^{48}Ti(α,nγ), Time Dependent Perturbed Angular

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Adopted Levels, Gammas (continued)

^{51}Cr Levels (continued)

E(level)[†]	J^{π}[@]	$T_{1/2}$[‡]	XREF	Comments
				Distribution (TDPAD) (1974Ko10). IAS of 5133 in ^{51}Mn.
776.95[e] *17*	1/2⁻	5.53 ns *7*	B FGHI L	J^{π}: L=1 in (d,p) gives 1/2⁻ and 3/2⁻. J^{π}=1/2⁻ from J dependence of $\sigma(\theta)$ in (d,p). For J^{π}=3/2⁻, the unobserved γ to g.s. would have B(E2)(W.u.)<0.00015; an unreasonably small value. $T_{1/2}$: From ^{51}V(p,nγ). IAS of 5077 in ^{51}Mn.
1164.59[g] *14*	9/2⁻	73 fs *7*	AB DE GHI KL	J^{π}: M1+E2 γ to 7/2⁻, M1 γ from 11/2⁻; also from measured angular distribution with non-pickup character and coupled-reaction channel (CRC) analysis in (^{3}He,α). $T_{1/2}$: From weighted av. of 76 fs *7* in ^{48}Ti(α,nγ) and 63 fs *12* in ^{51}V(p,nγ). Others: ≤0.7 ns in ^{51}Mn ε decay, and 77 fs in (HI,xnγ).
1352.65[e] *17*	5/2⁻	3.8 ps *+24−14*	AB FGHI KL	XREF: K(1347). J^{π}: M1+E2 γ to 3/2⁻, M1(+E2) γ to 7/2⁻, L=3 in ^{52}Cr(^{3}He,α), ^{50}Cr(d,p). $T_{1/2}$: other: >0.59 ps in ^{51}V(p,nγ).
1480.07[g] *16*	11/2⁻	0.55 ps *+24−4*	B DE GHI	XREF: E(1490). J^{π}: Stretched E2 γ to 7/2⁻, γ from 13/2⁻, L=3 in ^{50}V(^{3}He,d). $T_{1/2}$: others: 0.49 ps *+28−13* in ^{51}V(p,nγ), and 0.56 ps in (HI,xnγ).
1557.26[e] *13*	7/2⁻	4.2 ps *+17−10*	AB GHI KL	XREF: K(1546). J^{π}: E2 γ to 3/2⁻, L=3 and vector and tensor analyzing power in ^{50}Cr(pol d,p), L=3 in ^{52}Cr(^{3}He,α). $T_{1/2}$: other: >0.485 ps in ^{51}V(p,nγ).
1899.2[f] *3*	3/2⁻	0.29 ps *+3−2*	AB FGHI KL	XREF: K(1896). J^{π}: L=1 and vector and tensor analyzing power in ^{50}Cr(pol d,p). $T_{1/2}$: other: 0.27 ps *+10−5* in ^{51}V(p,nγ).
2001.91[f] *21*	5/2⁻	17[#] fs *2*	AB EFGHI KL	J^{π}: M1+E2 γ to 7/2⁻, L=3 in ^{50}V(^{3}He,d), also $\gamma(\theta)$, γ(pol) and RUL in ^{48}Ti(α,nγ). $T_{1/2}$: from average of 19 fs *4* (1971Iy03) and 15.2 fs *42* in (p,nγ). Other: 24 fs *10* in ^{48}Ti(α,nγ).
2255.5[g] *3*	15/2⁻	45.8 ps *14*	B DE HI	J^{π}: E2 γ to 11/2⁻, L=3 in ^{50}V(^{3}He,d), $\gamma(\theta)$ in ^{48}Ti(α,nγ). $T_{1/2}$: other: 46 ps in (HI,xnγ), >69 fs in ^{51}V(p,nγ).
2312.58[f] *17*	7/2⁻	15[#] fs *4*	AB GHI K	XREF: G(2319). J^{π}: (M1) γ to 9/2⁻, L=3 in ^{50}Cr(d,p) and ^{52}Cr(^{3}He,α), also $\gamma(\theta)$, γ(pol) and RUL in ^{48}Ti(α,nγ). $T_{1/2}$: other: <21 fs in ^{48}Ti(α,nγ).
2379.46[e] *14*	9/2⁻	0.31 ps *8*	B GHI	J^{π}: M1 γ to 7/2⁻, M1+E2 γ to 11/2⁻, also $\gamma(\theta)$, γ(pol) and RUL in ^{48}Ti(α,nγ). $T_{1/2}$: from weighted av of 0.37 ps *+14-9* (1971Iy03), 0.15 ps *12* (1985Av04) in (p,nγ), 0.42 ps *+14−10* in (α,nγ).
2385.4 *4*	13/2⁻	58[#] fs *12*	B E I K	XREF: E(2393)K(2391). J^{π}: M1+E2 γ to 11/2⁻, L=3 in ^{50}V(^{3}He,d), also $\gamma(\theta)$, γ(pol) and RUL in ^{48}Ti(α,nγ). $T_{1/2}$: From weighted av. of 59 fs *12* in ^{51}V(p,nγ) and 56 fs *+14−12* in ^{48}Ti(α,nγ).
2500			C	
2699 *10*	5/2⁻,7/2⁻		K	J^{π}: L(^{3}He,α)=3. IAR of 7106 in ^{51}Mn.
2704.39[e] *19*	11/2⁻	85[#] fs *3*	B G I	XREF: G(2709). J^{π}: E2 γ to 7/2⁻, also $\gamma(\theta)$, γ(pol) and RUL in ^{48}Ti(α,nγ);

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Adopted Levels, Gammas (continued)

^{51}Cr Levels (continued)

E(level)[†]	J^{π}[@]	$T_{1/2}$[‡]	XREF	Comments
				J=11/2 from shell-model calculation. $T_{1/2}$: others: 39 fs +30−20 in (p,nγ) (1971Iy03), >416 fs in (α,nγ) (1980Ka10), 234 fs +24−21 in (α,nγ) (1973Sz01).
2762.6 5	1/2$^+$	0.071 ps 10	B G I	XREF: B(2769). J^{π}: L=0 in ^{50}Cr(d, p) and (^{3}He,α).
2767.30[f] 18	9/2$^-$	41 fs 8	E I KL	J^{π}: 1287.2 γ M1+E2 to 11/2$^-$, L=3 in ^{50}V(^{3}He,d), also γ(θ), γ(pol) and RUL in ^{48}Ti(α,nγ). $T_{1/2}$: from unweighted av of 49 fs +14−12 in ^{48}Ti(α,nγ) and 33 fs 10 in ^{51}V(p,nγ).
2828.5 4	(3/2)$^-$	59 fs +12−10	AB FG I K	J^{π}: L=1 in (^{3}He,α), log ft=6.0 from 5/2$^-$, also γ(θ), γ(pol) and RUL in ^{48}Ti(α,nγ). IAR of 7274 in ^{51}Mn.
2890.2 4	3/2$^-$	0.35 ps +5−3	B FG I	J^{π}: L=1 and vector and tensor analyzing power in ^{50}Cr(pol d,p). IAR of 7314 and 7339 in ^{51}Mn.
2908.1[b] 7	(5/2)$^-$[b]		FG K	
2911.0[b] 4	(5/2)$^-$[b]	30 fs +19−10	B G I K	
2948.2 6	5/2$^-$,7/2$^-$	0.119 ps +13−10	B G I K	XREF: K(2955). J^{π}: L=3 in ^{50}Cr(d,p) and (^{3}He,α). J^{π}=3/2$^-$,5/2$^-$ for possible IAS in ^{51}Mn.
2970 8	3/2$^+$,5/2$^+$		G	J^{π}: L=2 in ^{50}Cr(d,p). J^{π}=5/2$^+$ for possible IAS of 7415 in ^{51}Mn.
3001.7 3	5/2$^-$	15 ps +5−4	B I	J^{π}: M1(+E2) γ to 7/2$^-$; γ(θ) in ^{48}Ti(α,nγ).
3004.4 3	3/2$^+$	0.34 ps 4	B g I k	J^{π}: γ(θ) to 5/2$^-$ and its linear polarization.
3016 8	5/2$^+$[a]		g k	J^{π}: 5/2$^+$ for IAR at 7459 in ^{51}Mn. This is consistent with L=(2) for the possible 3004.4 + 3016 peak in ^{51}Cr(d,p). E(level): 3012 10 level in ^{52}Cr(^{3}He,α) probably corresponds to either the 3004.4 3 or the 3016 8 levels.
3018.6 6	11/2$^-$	49 fs +21−15	B I	$T_{1/2}$: from 1973Sz01. other:<28 fs (1980Ka10). J^{π}: 3020.3 γ to 7/2$^-$, 633 γ to 13/2$^-$, RUL rules out 9/2$^-$; also γ(θ), γ(pol) and RUL in ^{48}Ti(α,nγ).
3055.9 6	1/2$^-$	69 fs 35	B FG	XREF: G(3051). J^{π}: L=1 in (d,p), also γ(θ), γ(pol) and RUL in ^{48}Ti(α,nγ). IAR of 7467 in ^{51}Mn.
3109.21 19	(7/2,9/2$^-$)	54 fs +12−16	B G I	J^{π}: D(+Q) γ to 9/2$^-$; γ(θ) in ^{48}Ti(α,nγ); γ to 5/2$^-$.
3125.9 2	3/2$^-$	83 fs +14−28	B FG K	XREF: G(3122)K(3116). J^{π}: L=1, vector and tensor analyzing power in ^{50}Cr(pol d,p), L=1 in (^{3}He,α), also γ(θ), γ(pol) and RUL in ^{48}Ti(α,nγ). Corresponding IAR in ^{51}Mn (7560 level) is 3/2$^-$,5/2$^-$.
3134.8 4	(3/2$^-$)	45 fs +20−19	B I	J^{π}: γ′s to 5/2$^-$ and 7/2$^-$; IAR of 7587 in ^{51}Mn.
3180.7[g] 6	(17/2)$^-$		B DE	$T_{1/2}$: an effective half-life of 0.42 ps is reported in (HI,xnγ). J^{π}: L=3 in ^{50}V(^{3}He,d), f7/2 band member.
3204.1 10	(5/2,7/2)$^-$	43 fs +21−18	B g	J^{π}: E(d,p)=3204 8, with L=3, could correspond to either or both the 3204.1 and 3207.22 levels. Also, presumably either or both of these levels could be the parent of the (5/2,7/2)IAR at 7669 in ^{51}Mn.
3207.22 25	7/2$^-$,9/2$^-$	55 fs 14	B g I	J^{π}: D+Q γ to 9/2$^-$, γ to 5/2$^-$. See also comments on J^{π} for 3204.1 level.
3262.6 7	(3/2$^-$)	31 fs +15−12	B GHI	J^{π}: γ to 7/2$^-$,g.s., 3/2$^-$ for IAR at 7715, 7718 in ^{51}Mn.
3266.9 8	$^-$		B E	J^{π}: L=3 in ^{50}V(^{3}He,d).
3344.21 25			B I	1787γ to 3344 and 3345 same final levels in (p,nγ) and (α,nγ).
3348.3 7			FG k	J^{π}: γ to 3/2$^-$.

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Adopted Levels, Gammas (continued)

^{51}Cr Levels (continued)

E(level)[†]	Jπ[@]	$T_{1/2}$[‡]	XREF	Comments
3351.1 *6*	3/2⁻,5/2⁻,7/2⁻[c]		B G k	Jπ: γ's to 3/2⁻ and 7/2⁻.
3376 *15*	9/2⁻ to 15/2⁻[&]		E	
3447.5 *9*	13/2⁻	<70 fs	B E	Jπ: M1(+E2) γ to 15/2⁻; L=1 in (^{3}He,d); also γ(θ) in ^{48}Ti(α,nγ).
3578.4 *11*	(11/2,13/2,15/2)	<70 fs	B	Jπ: γ to 13/2⁻.
3590 *15*	9/2⁻ to 15/2⁻[&]		E	
3719 *8*	1/2⁺		G	Jπ: L=0 in (d,p).
3722.1 *8*			I	
3759 *10*	9/2⁻ to 15/2⁻[&]		E	
3766.8 *3*	1/2⁻,3/2⁻[d]		B FG K	Jπ: 5495γ-CP measurement in ^{50}Cr(pol n,γ), γ from 1/2⁺ capture state is E1. Jπ=(3/2⁻) for possible IAR at 8199 in ^{51}Mn.
3770.5 *3*	1/2⁻,3/2⁻[d]	<28 fs	B F	Jπ=(3/2⁻) for possible IAR at 8216 in ^{51}Mn.
3816.7[g] *12*	(19/2⁻)		D	$T_{1/2}$: an effective half-life of 0.28 ps is reported in (HI,xnγ). Jπ: f7/2 band member.
3831.37 *22*	(7/2,9/2,11/2)⁻	30 fs +*8*−*6*	B E G I	Jπ: γ's to 7/2⁻ and 11/2⁻, L=3 in ^{50}V(^{3}He,d).
3863 *8*			G	
3870.7 *10*			B E	XREF: E(3878).
3897 *8*			G	
3900.3 *8*	(5/2⁺)	55 fs +*21*−*15*	B I	IAR of 8282 in ^{51}Mn.
3927.5 *10*	(5/2⁺)	<25 fs	B G I	IAR of 8307 in ^{51}Mn.
3933.7 *10*	9/2⁻ to 15/2⁻[&]		B E	
3947 *10*			G	
3953.2 *7*	(5/2⁺)	31 fs +*10*−*7*	B I	IAR of 8336 in ^{51}Mn.
3971.2 *8*			F	
3977.4 *6*	3/2⁺,5/2⁺	<35 fs	B G	Jπ: L=2 in ^{50}Cr(d,p) and RUL for γ to 7/2⁻ rules out mult=M2. 5/2⁺ for possible IAR at 8352, 8358 in ^{51}Mn.
3984.8 *5*	(5/2⁺)	22 fs +*5*−*4*	B I	IAR of 8340 in ^{51}Mn.
3990 *10*	3/2⁺,5/2⁺		K	Jπ: L=2 in (^{3}He,α). Jπ=3/2⁺ for IAR at 8389 in ^{51}Mn.
4005.2 *8*	5/2⁻,7/2⁻		B G	Jπ: L=3 in (d,p); Jπ=5/2⁻ for IAR at 8391 in ^{51}Mn.
4006.6 *9*			I	
4017.2 *7*	(3/2⁻,5/2,7/2⁻)	21 fs +*10*−*9*	B E	Jπ: γ's to 3/2⁻ and 7/2⁻. L=1+3 for E=4020 *15* in (^{3}He,d). If the L=3 component corresponds to this level, then Jπ=(5/2,7/2)⁻.
4020 *15*	9/2⁻ to 15/2⁻		B E	XREF: B(4030). Jπ: L=1+3 in ^{50}V(^{3}He,d).
4040.0 *3*	1/2⁻		FG	Jπ: L=1 in ^{50}Cr(d,p) and 5222γ-CP measurement from 1/2⁺ thermal neutron capture state in ^{50}Cr(pol n,γ). IAR of 8403 in ^{51}Mn.
4056			B	
4071.2 *6*	3/2⁺,5/2⁺	<40 fs	B G I K	XREF: K(4079). Jπ: L=2 in (^{3}He,α) and (d,p). Jπ=5/2⁺ for the IAR at 8408 in ^{51}Mn.
4099 *10*	7/2⁺,9/2⁺		G	Jπ: L=4 in (d,p). Jπ=9/2⁺ for the IAR at 8453 in ^{51}Mn.
4106.7 *8*			B I	
4111.0 *6*			B	
4119.1 *11*			B	

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Adopted Levels, Gammas (continued)

^{51}Cr Levels (continued)

E(level)†	Jπ@	XREF	Comments
4136.7 *8*		B G	
4155 *3*	7/2+,9/2+	G I	Jπ: L=4 in (d,p). Jπ=9/2+ for IAR at 8466 in ^{51}Mn.
4161.5 *8*		B	
4174 *15*	9/2− to 15/2−&	E G	
4181.7 *10*		B	
4189.2 *10*	3/2+,5/2+	B G I	Jπ: L=2 in (d,p). Jπ=5/2+ for IAR at 8491 in ^{51}Mn.
4198 *10*	(3/2)+	K	Jπ: From σ(Eα,θ) measurements and DWBA analyses, L=2 in (^{3}He,α).
4214 *15*	9/2− to 15/2−	E G	Jπ: L=1+3 in ^{50}V(^{3}He,d).
4239.2 *10*		B G	
4254.2 *10*		B	
4258 *10*	3/2+,5/2+	K	Jπ: L=2 in (^{3}He,α). Jπ=5/2+ for IAR at 8492 in ^{51}Mn.
4273 *4*		I	
4289.3 *5*	1/2+	FG	Jπ: L(d,p)=0; primary γ from 1/2+ in ^{50}Cr(n,γ), γ to 1/2− suggests Jπ≠5/2+. Jπ=1/2+ for IAR at 8749 in ^{51}Mn.
4318 *10*		G	
4336 *15*	9/2− to 15/2−&	E	
4354.6 *11*	(1/2−,3/2−)	B G	Jπ: L=(1) in (d,p).
4359 *10*	(3/2)+	K	Jπ: L=2 in (^{3}He,α).
4405.6 *11*		B G	
4426 *10*	1/2−	G	Jπ: L=1 in (d,p). Jπ=1/2− for IAR at 8893 in ^{51}Mn.
4439 *10*	(5/2)+	G	Jπ: L=2 in (d,p).
4451 *15*	9/2− to 15/2−&	E	
4495 *15*	−	E	Jπ: L=3 in ^{50}V(^{3}He,d).
4508 *10*		G	
4533 *10*		G	
4552 *15*	9/2− to 15/2−&	E	
4560.9 *6*	(5/2)	FG	Jπ: L=3 in (d,p).
4569 *10*	(3/2+)	K	Jπ: L=(2) in (^{3}He,α).
4577 *10*	(1/2)−	G	Jπ: L=1 in (d,p).
4583 *10*	(7/2)−	K	Jπ: L=3 in (^{3}He,α).
4609 *10*	1/2+	G	Jπ: L=0 in (d,p). IAR of 8915 in ^{51}Mn.
4629 *15*		E	
4637.0 *4*	3/2	F	Jπ: 4625γ CP measurement from 1/2+ thermal neutron capture state in ^{50}Cr(pol n,γ).
4647 *10*		G	
4668 *10*	(7/2)−	K	Jπ: L=3 in (^{3}He,α).
4669 *10*	(1/2−)	G	Jπ: L=(1) in (d,p).
4684 *10*	(5/2)+	G	Jπ: L=2 in (d,p).
4707 *15*		G	
4730 *10*		E G	
4742 *10*	9/2− to 15/2−&	E G	XREF: E(4746).
4769.6 *4*	1/2−,3/2−	FG	XREF: G(4767). Jπ: L(d,p)=1; primary γ from 1/2+ in ^{50}Cr(n,γ) is E1. Jπ=3/2− for IAR at 9186 in ^{51}Mn.
4793 *10*	(3/2−)	K	Jπ: L=(1) in (^{3}He,α).
4823 *10*		G	
4833.6 *4*		F	

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Adopted Levels, Gammas (continued)

^{51}Cr Levels (continued)

E(level)[†]	Jπ[@]	XREF	Comments
4849 *15*	(1/2)⁻	G	Jπ: L=1 in (d,p).
4874 *15*	(1/2⁻)	G	Jπ: L=(1) in (d,p).
4916 *15*		E	
4930		G	
4939 *15*	9/2⁻ to 15/2⁻[&]	E	
4964		G	
4978 *10*	(3/2⁺)	K	Jπ: L=(2) in (^{3}He,α).
4997 *15*		E G	
5030 *10*	(3/2⁺,5/2,7/2⁻)	K	Jπ: L=(2,3) in ^{52}Cr(^{3}He,α).
5053 *15*	9/2⁻ to 15/2⁻[&]	E	
5078 *15*		G	
5113 *15*	1/2⁺	G	Jπ: L=0 in (d,p).
5114 *15*	⁻	E	Jπ: L=3 in ^{50}V(^{3}He,d).
5121 *10*	(5/2)⁻	K	Jπ: L=3 in (^{3}He,α).
5145 *15*	(5/2⁻)	G	Jπ: L=(3) in (d,p).
5155 *15*	9/2⁻ to 15/2⁻[&]	E	
5177 *15*		G	
5203 *15*	9/2⁻ to 15/2⁻[&]	E	
5205.2 *8*	1/2⁻	FG	XREF: G(5202). Jπ: L=1 in (d,p). *J*π=1/2⁻ for IAR at 9515 in ^{51}Mn.
5222 *10*	1/2⁻,3/2⁻	K	Jπ: L=1 in (^{3}He,α). *J*π=1/2⁻ for IAR at 9516 in ^{51}Mn.
5230 *15*	9/2⁻ to 15/2⁻[&]	E	
5239.6 *11*	1/2,3/2	F	Jπ: 4022γ CP measurement from 1/2⁺ thermal-neutron capture state in ^{50}Cr(pol n,γ).
5249 *15*	(5/2)⁺	G	Jπ: L=2 in (d,p).
5265 *10*	(3/2)⁺	K	Jπ: L=2 in (^{3}He,α).
5270?		G	
5284 *15*	(5/2)⁺	G	Jπ: L=2 in (d,p).
5306 *10*	(7/2⁻,5/2,3/2⁺)	K	Jπ: L=(3,2) in ^{52}Cr(^{3}He,α).
5332 *15*	(5/2)⁺	G	Jπ: L=2 in (d,p).
5344 *15*	9/2⁻ to 15/2⁻[&]	E	
5346 *10*	(3/2⁺,5/2,7/2⁻)	K	Jπ: L=(2,3) in ^{52}Cr(^{3}He,α).
5357 *15*		G	
5395 *15*	(1/2)⁻	E G	XREF: E(5393). Jπ: L=1 in (d,p).
5409 *10*	(3/2)⁺	K	Jπ: L=2 in (^{3}He,α).
5420 *15*	⁻	E	Jπ: L=3 in ^{50}V(^{3}He,d).
5447	(1/2⁻)	G	Jπ: L=(1) in (d,p).
5449 *15*		E	
5455 *10*	(7/2)⁻	K	Jπ: L=3 in (^{3}He,α).
5464 *15*		G	
5473 *15*		E	
5495 *15*	(1/2)⁻	G	Jπ: L=1 in (d,p).
5532 *15*	(5/2⁺)	G	Jπ: L=(2) in (d,p).
5537 *10*	(3/2)⁺	K	Jπ: L=2 in (^{3}He,α).
5560 *15*	9/2⁻ to 15/2⁻[&]	E	
5563[g]	(21/2⁻)	D	Jπ: f7/2 band member.
5580 *15*		G	
5605 *15*		G	
5630 *15*	(1/2⁻)	G	Jπ: L=(1) in (d,p).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{51}Cr Levels (continued)

E(level)[†]	Jπ[@]	XREF	Comments
5656 *15*		E	
5668.2 *5*	(1/2)⁻	FG	XREF: G(5663). Jπ: L=1 in (d,p).
5699 *15*		G	
5711[g]	(23/2⁻)	D	Jπ: f7/2 band member. $T_{1/2}$: an effective half-life of 1.18 ps is reported in (HI,xnγ).
5711 *15*		E	E(level): probably different from 23/2⁻, 5711 level in (HI,xnγ). Excitation will require L=5.
5725 *15*		G	
5741 *15*	(1/2)⁻	G	Jπ: L=1 in (d,p).
5761 *10*	(3/2)⁺	K	Jπ: L=2 in (^{3}He,α).
5769? *15*		G	
5787 *15*		E	
5812 *15*		G	
5832 *10*	(7/2)⁻	K	Jπ: L=3 in (^{3}He,α).
5850 *15*		G	
5880 *15*		E	
5928 *15*		G	
5943 *10*	(1/2,3/2⁻)	K	Jπ: L=(0,1) in ^{52}Cr(^{3}He,α).
5950 *15*	(1/2)⁻	FG	Jπ: L=1 in (d,p).
5964 *15*	9/2⁻ to 15/2⁻[&]	E	
5970		G	
5991 *15*	1/2⁺	G	Jπ: L=0 in (d,p).
6034 *15*	(1/2)⁻	G	Jπ: L=1 in (d,p).
6075 *15*		G	
6107 *15*		G	
6122 *15*	(1/2⁻)	G	Jπ: L=(1) in (d,p).
6136		G	
6157 *15*		G	
6162	(21/2,23/2⁻)	D	Jπ: shell model calculation and γ to 19/2⁻.
6184 *15*	1/2⁺	G	Jπ: L=0 in (d,p).
6219 *15*		G	
6236 *15*	(1/2)⁻	G	Jπ: L=1 in (d,p).
6254 *15*	1/2⁺	G	Jπ: L=0 in (d,p).
6285		G	
6306 *15*	(5/2⁺)	G	Jπ: L=(2) in (d,p).
6332 *15*	(1/2⁻)	G	Jπ: L=(1) in (d,p).
6360 *15*	1/2⁺	G	Jπ: L=0 in (d,p).
6378 *10*	(3/2)⁺	G K	XREF: G(6377). Jπ: L=2 in (^{3}He,α).
6413 *15*		G	
6438 *15*	1/2⁺	G	Jπ: L=0 in (d,p).
6478 *15*		G	Jπ: L=(0) for 6478 + 6485 peaks in ^{50}Cr(d,p).
6485 *15*		G	Jπ: L=(0) for 6478 + 6485 peaks in ^{50}Cr(d,p).
6518 *15*		G	Jπ: L=2 for 6518 + 6523 peaks in ^{50}Cr(d,p).
6523		G	Jπ: L=2 for 6518 + 6523 peaks in ^{50}Cr(d,p).
6564		G	
6604 *15*	(5/2)⁺	G	Jπ: L=2 in (d,p).
6611[h] *5*	7/2⁻	H JK	XREF: H(6650)K(6630). Jπ: L(^{3}He,α)=3, IAS of 7/2⁻ g.s. in ^{51}V.
6660 *15*	(5/2⁺)	G	Jπ: L=(2) in (d,p).
6680 *15*		G	
6693 *15*		C G	
6718 *15*		G	

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Adopted Levels, Gammas (continued)

^{51}Cr Levels (continued)

E(level)†	Jπ@	XREF	Comments
6723 *15*		G	
6741 *15*		G	
6760 *15*		G	
6775 *15*	(5/2)+	G	Jπ: L=2 in (d,p).
6803 *15*	(5/2)+	G	Jπ: L=2 in (d,p).
6820		G	
6866 *15*	(5/2)+	G	Jπ: L=2 in (d,p).
6879 *15*		G	
6894	(23/2,25/2−)	D	Jπ: γ to (21/2−) and shell calculation. $T_{1/2}$: an effective half-life of <2 ps is reported in (HI,xnγ).
6896 *15*	(1/2)−	G	Jπ: L=1 in (d,p).
6920 *15*		G	
6979 *15*		G	
6995 *15*	(1/2−)	G	Jπ: L=(1) in (d,p).
7018 *15*	1/2+	G	Jπ: L=0 in (d,p).
7038 *15*	(1/2)−	G	Jπ: L=1 in (d,p).
7078		G	Jπ: L=(2) for 7078 + 7088 peaks in ^{50}Cr(d,p).
7088		G	Jπ: L=(2) for 7078 + 7088 peaks in ^{50}Cr(d,p).
7130 *15*	(5/2)−	G	Jπ: L=3 in (d,p).
7141 *15*		G	
7167 *15*	(5/2+)	G	Jπ: L=(2) in (d,p).
7208.4 *7*	(1/2)−	FG	XREF: G(7205). Jπ: L=1 in (d,p).
7240 *15*		G	
7247.9 *9*	(1/2,3/2,5/2+)	F	Jπ: primary γ from 1/2+ in ^{50}Cr(n,γ).
7271 *15*		G	Jπ: L=(0) for 7268 + 7278 peaks in ^{50}Cr(d,p).
7282 *15*		G	Jπ: L=(0) for 7268 + 7278 peaks in ^{50}Cr(d,p).
7302 *15*	1/2+	G K	XREF: K(7310). Jπ: L=0 in (d,p) and (^{3}He,α).
7342 *15*	1/2+	G	Jπ: L=0 in (d,p).
7388 *15*	(5/2)+	G	Jπ: L=2 in (d,p).
7426 *15*	(5/2)+	G	Jπ: L=2 in (d,p).
7445 *15*		G	
7479 *15*		G	
7504 *15*		G	
7555 *15*	(5/2)+	G	Jπ: L=2 in (d,p).
7590 *15*	1/2+	G	Jπ: L=0 in (d,p).
7628		G	Jπ: L=2 for 7628 + 7648 peaks in ^{50}Cr(d,p).
7643		G	Jπ: L=2 for 7628 + 7648 peaks in ^{50}Cr(d,p).
7670 *15*	1/2+	G K	XREF: K(7680). Jπ: L=0 in (d,p) and (^{3}He,α).
7689		G	Jπ: L=2 for 7689 + 7703 peaks in ^{50}Cr(d,p).
7703		G	Jπ: L=2 for 7689 + 7703 peaks in ^{50}Cr(d,p).
7721 *15*		G	
7758 *15*		G	
7787 *15*	3/2+,5/2+	G K	Jπ: L=2 in (d,p) and (^{3}He,α).
7818 *15*		G	Jπ: L=2 for 7819 + 7834 peaks in ^{50}Cr(d,p).
7835 *15*		G	Jπ: L=2 for 7819 + 7834 peaks in ^{50}Cr(d,p).
7856 *15*		G	
7874 *15*	(5/2+)	G	Jπ: L=(2) in (d,p).
7901 *15*	1/2+	G	Jπ: L=0 in (d,p).
7932 *15*	(5/2)+	G	Jπ: L=2 in (d,p).
7954	1/2+	G	Jπ: L=0 in (d,p).
8003	1/2+	G	Jπ: L=0 in (d,p).

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Adopted Levels, Gammas (continued)

^{51}Cr Levels (continued)

E(level)[†]	J^{π}[@]	XREF	Comments
8024		G	
8047	1/2$^+$	G	J^{π}: L=0 in (d,p).
8078	1/2$^+$	G	J^{π}: L=0 in (d,p).
8124	(5/2)$^+$	G	J^{π}: L=2 in (d,p).
8420 *20*	(1/2$^+$)	K	J^{π}: L=(0) in ^{52}Cr(^{3}He,α).
8480 *20*	1/2$^+$	K	J^{π}: L=0 in ^{52}Cr(^{3}He,α).
8485	(25/2,27/2$^-$)	D	J^{π}: shell model calculation and γ to 23/2$^-$.
9000		C	
9220[i] *20*	1/2$^+$	K	J^{π}: L=0 in ^{52}Cr(^{3}He,α).
9261.63 *22*	1/2$^+$	F	
9330[j] *20*	3/2$^+$,5/2$^+$	K	J^{π}: L=2 in ^{52}Cr(^{3}He,α), J^{π}=3/2$^+$ for possible IAS at 2667 in ^{51}V.

[†] For bound states connected by gammas, E(level) are from level scheme and Eγ's, using least-squares fit to data. In addition to the levels given here, broad peaks are observed in (^{3}He,n), at 0, 2500, 6700, and 9000. For unbound states, E(level) are from (n,γ), except as noted.

[‡] From DSA measurement in ^{48}Ti(α,nγ), except as noted.

[#] From DSA measurement in ^{51}V(p,nγ).

[@] From L value in ^{50}Cr(d,p) or ^{52}Cr(^{3}He,α), and IAR in ^{51}Mn, except as noted.

[&] L=1 in ^{50}V(^{3}He,d).

[a] From corresponding IAR in ^{51}Mn.

[b] E=2907 *8* in (d,p) and 2914 *10* in (^{3}He,α), both with L=3, could correspond to either or both of the 2908.1 and 2911.0 levels. There is a 5/2$^-$ resonance at 7357 in ^{51}Mn that could be the IAR of either or both of these levels.

[c] J^{π}=5/2$^-$ for E=3352 *8* in (d,p) from L=3 and analyzing power, and J^{π}=5/2$^-$,7/2$^-$ for E=3349 *10* in (^{3}He,α) from L=3. These peaks could correspond to either or both the 3348.3 and 3351.1 levels. Possible IAR with J^{π}=5/2$^-$ are observed at 7787 and 7792 in ^{51}Mn. If the analog association is correct, then both the 3348.3 and 3351.1 levels can be assigned J^{π}=5/2$^-$.

[d] L(d,p),(^{3}He,α)=1 for the 3766.8 and/or 3770.2 levels. In (pol d,p), 1977Ba14 suggest the possibility of a 1/2$^-$,3/2$^-$ doublet. Possible parent analogs of levels in ^{51}Mn with E=8199 and 8216, both with J^{π}=(3/2$^-$). If L=1 for 3770.2, then γ-CP in (n,γ) gives J=3/2.

[e] Band(A): K^{π}=1/2$^-$ band. Members of band: 1/2$^-$ to 11/2$^-$. Band parameter: A=77.34 b=−0.49 (1985Av04,1980Ka10,1980Ah04).

[f] Band(B): K^{π}=3/2$^-$ band. Members of band: 3/2$^-$ to 9/2$^-$. Band parameter: A=16.28, B=0.91 (1985Av04).

[g] Band(C): f7/2 band. Members of band: 7/2$^-$ to 23/2$^-$ (1991Ca30).

[h] IAS of 7/2$^-$ g.s. in ^{51}V.

[i] IAS of 1/2$^+$ 2546 in ^{51}V.

[j] IAS of (3/2)$^+$ 2677 in ^{51}V.

Adopted Levels, Gammas (continued)

$\gamma(^{51}Cr)$

E_i(level)	J_i^π	E_γ[†]	I_γ[&]	E_f	J_f^π	Mult.[a]	δ[a]	α[f]	Comments
749.10	3/2⁻	749.07 *9*	100	0.0	7/2⁻	E2			B(E2)(W.u.)=0.065 *8*
776.95	1/2⁻	27.85 *19*	100	749.10	3/2⁻	M1		0.905	α(K)=0.800; α(L)=0.0794 B(M1)(W.u.)=0.077 *8* E_γ: from E(level) difference. Mult.: from ^{51}V(p,nγ). Comparison to RUL gives $\delta^2<7.8\times10^{-4}$. δ: $\delta^2<0.017$ in ^{51}V(p,nγ).
		(776.95 *17*)	<0.6	0.0	7/2⁻				E_γ: transition not observed. Eγ from E(level) difference. I_γ: from 1970Sa15 in (p,nγ) and (α,nγ).
1164.59	9/2⁻	1164.5 *1*	100	0.0	7/2⁻	M1+E2	−0.19 *+4−2*		B(M1)(W.u.)=0.177 *17*; B(E2)(W.u.)=11 *5* E_γ: from (p,nγ). other δ:−0.17 *+1−2* from (α,nγ); −0.8 *+3−4* from (p,nγ).
1352.65	5/2⁻	575.6 *1*	16.0[#] *5*	776.95	1/2⁻	E2			B(E2)(W.u.)=19 *+7−12* E_γ: from (p,nγ).
		603.5 *3*	100.0[#] *21*	749.10	3/2⁻	M1+E2	+0.40 *+8−4*		B(M1)(W.u.)=0.0128 *7*; B(E2)(W.u.)=13 *5* E_γ: from weighted average of 603.3 *4* in (n,γ) and 603.8 *5* in ε decay. Other:603.4 *9* in (p,nγ). other δ:+0.07 *4* in (p,nγ).
		1353.7 *6*	61.5[#] *14*	0.0	7/2⁻	M1(+E2)	+0.06 *+6−9*		B(M1)(W.u.)=0.000807 *6* E_γ: from a weighted average of 1353.5 *9* in (n,γ) and 1353.9 *8* in ε decay. other: 1352.8 *3* in (α,nγ). other δ:+0.19 *3* from (p,nγ).
1480.07	11/2⁻	315.60 *20*	92.7 *21*	1164.59	9/2⁻	M1(+E2)	+0.03 *3*		Mult.: D(+Q) from $\gamma(\theta)$ in (α,nγ); polarity from level scheme.
		1480.3 *3*	100[#] *3*	0.0	7/2⁻	E2			B(E2)(W.u.)=6.7 *+6−3*
1557.26	7/2⁻	204.0[#] *8*	6.42[#] *13*	1352.65	5/2⁻	[M1]			B(M1)(W.u.)=0.031 *+8−13*
		808.19 *21*	100.0[#] *25*	749.10	3/2⁻	E2			B(E2)(W.u.)=28 *+7−12*
		1557.5 *3*	19.5[#] *4*	0.0	7/2⁻	M1+E2	−0.38 *11*		B(M1)(W.u.)=0.000188 *14*; B(E2)(W.u.)=0.024 *13* I_γ: other: 17.3 *25* in (α,nγ), 27 *4* in ε decay.
1899.2	3/2⁻	1124.0[‡] *9*	10.7[c] *12*	776.95	1/2⁻				
		1149.4[‡] *9*	24.60[c] *7*	749.10	3/2⁻				
		1899.41 *25*	100.0[c] *5*	0.0	7/2⁻	E2			B(E2)(W.u.)=5.2 *4* E_γ: from ε decay.
2001.91	5/2⁻	2001.35 *12*	100	0.0	7/2⁻	M1+E2	−0.09 *6*		B(M1)(W.u.)=0.160 *19*
2255.5	15/2⁻	775.4 *2*	100	1480.07	11/2⁻	E2			B(E2)(W.u.)=3.92 *12*
2312.58	7/2⁻	1148.0 *3*	100 *3*	1164.59	9/2⁻	[M1]			B(M1)(W.u.)=0.84 *23*
		2312.52 *23*	16.1 *12*	0.0	7/2⁻	[M1]			B(M1)(W.u.)=0.016 *5*
2379.46	9/2⁻	822.3[#] *3*	46[e] *7*	1557.26	7/2⁻	M1+E2	+1.2[#] *+5−8*		Mult.: D+Q from (p,nγ) and (HI,xnγ).

$\gamma(^{51}Cr)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[&]	E_f	J_f^π	Mult.[a]	δ[a]	Comments
2379.46	9/2⁻	899.9[#] *5*	64[e] *11*	1480.07	11/2⁻	M1(+E2)	+0.02 *+14−13*	B(M1)(W.u.)=0.017 *6*
		1026.7[#] *2*	93[e] *11*	1352.65	5/2⁻	E2		B(E2)(W.u.)=37 *11* δ:+0.02 *13*.
		1215.5[#] *5*	54[e] *7*	1164.59	9/2⁻	M1+E2		B(M1)(W.u.)<0.0063; B(E2)(W.u.)<9.8
		2379.3[#] *2*	100[e] *11*	0.0	7/2⁻	M1+E2	−0.78[#] *+25−33*	B(M1)(W.u.)=0.0009 *4*; B(E2)(W.u.)=0.23 *11*
2385.4	13/2⁻	905.3 *3*	100	1480.07	11/2⁻	M1+E2	−0.07 *2*	B(M1)(W.u.)=0.50 *11*; B(E2)(W.u.)=14 *13*
2704.39	11/2⁻	1147.9[#] *3*	100[d] *6*	1557.26	7/2⁻	E2		B(E2)(W.u.)=220 *19*
		1224.7[#] *3*	18.9[d] *14*	1480.07	11/2⁻	M1(+E2)	+0.3 *+8−5*	B(M1)(W.u.)=0.013 *6* other δ:0.09 *2* from (p,nγ).
		1538.8[#] *3*	12.2[d] *14*	1164.59	9/2⁻	M1(+E2)	−0.09 *+39−24*	B(M1)(W.u.)=0.0064 *10*
		2703.6[#] *6*	4.1[d] *14*	0.0	7/2⁻			B(E2)(W.u.)=0.163 *24*
2762.6	1/2⁺	2013.6[#] *5*	100[#]	749.10	3/2⁻	[E1]		B(E1)(W.u.)=0.00085 *12*
2767.30	9/2⁻	454.8[#] *5*	4.2[#]	2312.58	7/2⁻			
		1287.2[#] *4*	43[#] *4*	1480.07	11/2⁻	M1+E2	+0.09 *2*	B(M1)(W.u.)=0.054 *12*; B(E2)(W.u.)=0.4 *+17−3* δ: From (p,nγ). Other: +0.07 *+16−14* in (α,nγ).
		1603.4[#] *5*	53[#] *4*	1164.59	9/2⁻	[M1]		B(M1)(W.u.)=0.034 *8*
		2767.1[#] *2*	100[#] *6*	0.0	7/2⁻	M1+E2	−0.36 *11*	B(M1)(W.u.)=0.0114 *25*; B(E2)(W.u.)=0.39 *25* δ: From (p,nγ). Mult.: D+Q from (p,nγ).
2828.5	(3/2)⁻	826.9[‡] *8*	77 *10*	2001.91	5/2⁻			
		928.2[‡] *9*	27 *13*	1899.2	3/2⁻			
		2079.62 *16*	100 *12*	749.10	3/2⁻	M1(+E2)	+0.09 *+30−25*	B(M1)(W.u.)=0.0202 *11* Mult.: D(+Q) from $\gamma(\theta)$ in (α,nγ); polarity from no parity change based on L(^{3}He,α)=1.
2890.2	3/2⁻	510.8[#i] *3*	61[#]	2379.46	9/2⁻			
		888.2[‡] *8*	100[‡] *10*	2001.91	5/2⁻			E_γ: other: 888.7 *2* in (p,nγ).
		990.4[‡] *9*	36[‡] *7*	1899.2	3/2⁻			
		1537.2[‡] *8*	88[‡] *9*	1352.65	5/2⁻			
		2113.4[‡] *7*	51[‡] *14*	776.95	1/2⁻			
		2141.3[g‡] *7*	22[g‡] *6*	749.10	3/2⁻			
2908.1	(5/2)⁻	2159.0[‡] *7*	100	749.10	3/2⁻			
2911.0	(5/2)⁻	1353	100 *12*	1557.26	7/2⁻			
		1557	10 *7*	1352.65	5/2⁻			
		2161	19 *4*	749.10	3/2⁻			
		2911	43 *5*	0.0	7/2⁻			
2948.2	5/2⁻,7/2⁻	1049	86 *6*	1899.2	3/2⁻			

γ(^{51}Cr) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[&]	E_f	J_f^π	Mult.[a]	δ[a]	Comments
2948.2	5/2⁻,7/2⁻	1391.3 *2*	100 *6*	1557.26	7/2⁻	M1(+E2)	−0.22 *+22−26*	E_γ: from (p,nγ). Mult.: D(+Q) from γ(θ) in (α,nγ); polarity from no parity change based on L(^{3}He,α)=3.
		2948.8 *2*	92 *6*	0.0	7/2⁻			E_γ: from (p,nγ). I_γ: other: 64 *10* in (p,nγ).
3001.7	5/2⁻	3001.6[#] *3*	100	0.0	7/2⁻	M1(+E2)	−0.07 *+7−10*	B(M1)(W.u.)=5.40×10⁻⁵ *6* Mult.: From γ(θ) and γ(pol) in (α,nγ).
3004.4	3/2⁺	1002.7[#] *4*	100 *5*	2001.91	5/2⁻	E1(+M2)	+0.12 *+23−19*	B(E1)(W.u.)=0.00078 *12* Mult.: D(+Q) from ^{48}Ti(α,nγ) and comparison to RUL.
		2255.1[#] *3*	82 *6*	749.10	3/2⁻	E1(+M2)	+1.9 *+18−19*	B(E1)(W.u.)<6.5×10⁻⁵ Mult.: D(+Q) from ^{48}Ti(α,nγ) and comparison to RUL. δ: From 1980Ka10.
3018.6	11/2⁻	633	32 *5*	2385.4	13/2⁻	[M1]		B(M1)(W.u.)=0.32 *+10−14* Mult.: Assumed in (α,nγ).
		1538	11 *5*	1480.07	11/2⁻	[M1]		B(M1)(W.u.)=0.0071 *+23−31* Mult.: Assumed in (α,nγ).
		1853	33 *5*	1164.59	9/2⁻	[M1]		B(M1)(W.u.)=0.013 *+5−6* Mult.: Assumed in (α,nγ).
		3020.3[#] *2*	100 *14*	0.0	7/2⁻	[E2]		B(E2)(W.u.)=2.4 *+9−11* Mult.: Assumed in (α,nγ).
3055.9	1/2⁻	1157	41 *11*	1899.2	3/2⁻	(M1)		B(M1)(W.u.)=0.05 *3*
		2279.2[‡] *7*	100 *28*	776.95	1/2⁻			
		2306	44 *11*	749.10	3/2⁻			
3109.21	(7/2,9/2⁻)	1107.3[#] *2*	89.5[#]	2001.91	5/2⁻			
		1755.7[#] *7*	7.9[#]	1352.65	5/2⁻			
		1944.6[#] *2*	65.8[#]	1164.59	9/2⁻	M1(+E2)	−0.18 *+27−21*	B(M1)(W.u.)=0.0134 *13* Mult.: from D(+Q) to 9/2⁻ 1164 and comparison to RUL.
		3109.0[#] *4*	100[#]	0.0	7/2⁻			
3125.9	3/2⁻	1123	35 *7*	2001.91	5/2⁻			E_γ,I_γ: from (α,nγ).
		2348.9[‡] *5*	47 *7*	776.95	1/2⁻			I_γ: from (α,nγ).
		2376.7[‡] *5*	100 *9*	749.10	3/2⁻			I_γ: from (α,nγ).
3134.8	(3/2⁻)	1782.2[#] *3*	100[#]	1352.65	5/2⁻			
		3134.0[#] *7*	6.4[#]	0.0	7/2⁻			
3180.7	(17/2)⁻	925.2 *5*	100	2255.5	15/2⁻	D+Q		Mult.: from γ(θ) in (HI,xnγ).
3204.1	(5/2,7/2)⁻	3204	100	0.0	7/2⁻			
3207.22	7/2⁻,9/2⁻	296.0[#] *7*	0.65[#]	2911.0	(5/2)⁻			
		1649.8[#] *5*	18[#]	1557.26	7/2⁻			

$\gamma(^{51}Cr)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[&]	E_f	J^π_f	Mult.[a]	δ[a]	Comments
3207.22	7/2⁻,9/2⁻	1854.6[#] 3	32[#]	1352.65	5/2⁻			
		2042.5[#] 7	100[#]	1164.59	9/2⁻	M1+E2	−0.42 +15−28	B(M1)(W.u.)=0.025 7; B(E2)(W.u.)=2.4 16 Mult.: from D+Q to 9/2⁻ 1164 and comparison to RUL.
		3207.3[#] 7	11.29[#]	0.0	7/2⁻			
3262.6	(3/2⁻)	2514	100 7	749.10	3/2⁻	[M1,E2]		
		3262	72 7	0.0	7/2⁻	[E2]		B(E2)(W.u.)=1.8 +8−10
3266.9	⁻	1787	100 7	1480.07	11/2⁻			
		2102	16 7	1164.59	9/2⁻			
3344.21		432.0[#] 7	2.17[#]	2911.0	(5/2)⁻			
		1343	45 9	2001.91	5/2⁻			
		1787.4[#] 3	100[#] 9	1557.26	7/2⁻			
		3343.6[#] 4	6.5	0.0	7/2⁻			
3348.3		2598.9[‡] 7	100	749.10	3/2⁻			
3351.1	3/2⁻,5/2⁻,7/2⁻	1451	94 17	1899.2	3/2⁻			
		1792	100 17	1557.26	7/2⁻			
		2001	91 17	1352.65	5/2⁻			
3447.5	13/2⁻	1192.0 8	100	2255.5	15/2⁻	M1(+E2)	+0.03 3	Mult.: From γ(θ) & γ(pol) in (α,nγ).
3578.4	(11/2,13/2,15/2)	1193	100	2385.4	13/2⁻			
3722.1		2164.6[#] 8	100[#]	1557.26	7/2⁻			
		3722.7[#] 15	9.9[#]	0.0	7/2⁻			
3766.8	1/2⁻,3/2⁻	2990.0[‡] 5	91[‡] 18	776.95	1/2⁻			
		3017.3[‡] 4	100[‡] 18	749.10	3/2⁻			
3770.5	1/2⁻,3/2⁻	862.3[‡] 6	5[‡] 3	2908.1	(5/2)⁻			
		2995	45 9	776.95	1/2⁻			
		3021.3[‡] 4	100[‡] 13	749.10	3/2⁻			
3816.7	(19/2⁻)	636[‡]	100[‡]	3180.7	(17/2)⁻	D+Q		Mult.: From (HI,xnγ).
3831.37	(7/2,9/2,11/2)⁻	1453.4[#] 15	9[#]	2379.46	9/2⁻	(D,E2)[b]		
		2273.6[#] 3	100[#]	1557.26	7/2⁻	(D,E2)[b]		
		2350.5[#] 6	42[#]	1480.07	11/2⁻	(D,E2)[b]		
		3831.6[#] 3	71[#]	0.0	7/2⁻	(D,E2)[b]		
3870.7		2706	100	1164.59	9/2⁻			
3900.3	(5/2⁺)	2001	8 6	1899.2	3/2⁻	[E1]		B(E1)(W.u.)=8.E−5 5
		3901.9[#] 3	100 4	0.0	7/2⁻	[E1]		B(E1)(W.u.)=0.00014 +4−6
3927.5	(5/2⁺)	1037.7[#] 11	100[#]	2890.2	3/2⁻	[E1]		B(E1)(W.u.)>0.0068
		2448.9[h#i] 10	85[h#]	1480.07	11/2⁻			
		3926[#] 2	72[#]	0.0	7/2⁻	[E1]		B(E1)(W.u.)>9.1×10⁻⁵

$^{51}_{24}Cr_{27}$-13

Adopted Levels, Gammas (continued)

γ(^{51}Cr) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[&]	E_f	J^π_f	Mult.[a]	Comments
3933.7	9/2⁻ to 15/2⁻	2769	100	1164.59	9/2⁻		
3953.2	(5/2⁺)	2600.4[#] 4	69[#]	1352.65	5/2⁻	[E1]	B(E1)(W.u.)=0.00028 +7−10
		3202	54 8	749.10	3/2⁻	[E1]	B(E1)(W.u.)=0.00012 +4−5
		3954.4 6	100 8	0.0	7/2⁻	[E1]	B(E1)(W.u.)=0.00012 +3−4 E_γ: from (p,nγ).
3971.2		845.2[‡] 8	100	3125.9	3/2⁻		
3977.4	3/2⁺,5/2⁺	2419	35 17	1557.26	7/2⁻	[E1]	B(E1)(W.u.)>0.00018
		2624	100 19	1352.65	5/2⁻	[E1]	B(E1)(W.u.)>0.00040
		3230	58 12	749.10	3/2⁻	[E1]	B(E1)(W.u.)>0.00013
3984.8	(5/2⁺)	983	70 18	3001.7	5/2⁻	[E1]	B(E1)(W.u.)=0.0073 +25−27
		1982	36 14	2001.91	5/2⁻	[E1]	B(E1)(W.u.)=0.00046 +21−22
		2428	20 9	1557.26	7/2⁻	[E1]	B(E1)(W.u.)=0.00014 +7−8
		3984.3 13	100 18	0.0	7/2⁻	[E1]	B(E1)(W.u.)=0.00016 1 E_γ: from (p,nγ).
4005.2	5/2⁻,7/2⁻	2001		2001.91	5/2⁻		
		2108		1899.2	3/2⁻		
4006.6		2448.9[h#i] 10	100[h#]	1557.26	7/2⁻		
		4006.4[#] 9	100[#]	0.0	7/2⁻		
4017.2	(3/2⁻,5/2,7/2⁻)	3267		749.10	3/2⁻		
		4018		0.0	7/2⁻		
4020	9/2⁻ to 15/2⁻	3281	100	749.10	3/2⁻		
4040.0	1/2⁻	913.2[‡] 9	11[‡] 3	3125.9	3/2⁻		
		2141.3[g‡] 7	22[g‡] 6	1899.2	3/2⁻		
		3262.8[‡] 4	100[‡] 13	776.95	1/2⁻		
		3290.8[‡] 5	35[‡] 11	749.10	3/2⁻		
4056		2156	47 18	1899.2	3/2⁻		
		2703	100 18	1352.65	5/2⁻		
4071.2	3/2⁺,5/2⁺	2513		1557.26	7/2⁻		
		3321		749.10	3/2⁻		
		4071 2		0.0	7/2⁻		E_γ: from (p,nγ).
4106.7		1105	69 20	3001.7	5/2⁻		
		2942	100 20	1164.59	9/2⁻		
		4108[#i] 2		0.0	7/2⁻		
4111.0		1350		2762.6	1/2⁺		
		2109		2001.91	5/2⁻		
		3360		749.10	3/2⁻		
4119.1		2117	100	2001.91	5/2⁻		
4136.7		1373	18 15	2762.6	1/2⁺		
		2785	100 15	1352.65	5/2⁻		

γ(^{51}Cr) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[&]	E_f	J^π_f	Mult.[a]	Comments
4155	7/2$^+$,9/2$^+$	4155[#] 3	100	0.0	7/2$^-$		
4161.5		2603	61 16	1557.26	7/2$^-$		
		2998	100 16	1164.59	9/2$^-$		
4181.7		3017	100	1164.59	9/2$^-$		
4189.2	3/2$^+$,5/2$^+$	4190 3	100	0.0	7/2$^-$		E_γ: from (p,nγ).
4239.2		4239	100	0.0	7/2$^-$		
4254.2		4254	100	0.0	7/2$^-$		
4273		4273[#] 4	100[#]	0.0	7/2$^-$		
4289.3	1/2$^+$	3512.2[‡] 4	100	776.95	1/2$^-$		
4354.6	(1/2$^-$,3/2$^-$)	1592	100	2762.6	1/2$^+$		
4405.6		1643	100	2762.6	1/2$^+$		
4560.9	(5/2)	3207.5[‡] 7	100	1352.65	5/2$^-$		
4637.0	3/2	1808.8[‡] 7	23[‡] 6	2828.5	(3/2)$^-$		
		3284.2[‡] 8	19[‡] 6	1352.65	5/2$^-$		
		3859.8[‡] 4	100[‡] 21	776.95	1/2$^-$		
4769.6	1/2$^-$,3/2$^-$	1002.1[‡] 9	28 7	3766.8	1/2$^-$,3/2$^-$		
		4020.5[‡] 4	100 30	749.10	3/2$^-$		
4833.6		4833.2[‡] 4	100	0.0	7/2$^-$		
5205.2	1/2$^-$	3305.8[‡] 7	100	1899.2	3/2$^-$		
5563	(21/2$^-$)	1746[@]	100	3816.7	(19/2$^-$)		
5668.2	(1/2)$^-$	834.1[‡] 8	100[‡] 23	4833.6			
		1106.5[‡] 9	45[‡] 13	4560.9	(5/2)		
		4891.4[‡] 5	81[‡] 16	776.95	1/2$^-$		
5711	(23/2$^-$)	1894[@]	100	3816.7	(19/2$^-$)	Q	Mult.: From (HI,xnγ).
6162	(21/2,23/2$^-$)	2345[@]		3816.7	(19/2$^-$)		
6894	(23/2,25/2$^-$)	1331[@]	100	5563	(21/2$^-$)		
7208.4	(1/2)$^-$	5206.1[‡] 6	100	2001.91	5/2$^-$		
7247.9	(1/2,3/2,5/2$^+$)	3276.8[‡] 7	61 16	3971.2			
		3898.9[‡] 5	100 23	3348.3			
8485	(25/2,27/2$^-$)	2774[@]	100	5711	(23/2$^-$)		
9261.63	1/2$^+$	2013.3 6	2.7 7	7247.9	(1/2,3/2,5/2$^+$)		
		2052.9 5	0.3 1	7208.4	(1/2)$^-$		
		3305.8[i] 7	0.23 13	5950	(1/2)$^-$		
		3593.4 4	3.0 7	5668.2	(1/2)$^-$		
		4057.4 5	0.47 13	5205.2	1/2$^-$		

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Adopted Levels, Gammas (continued)

γ(^{51}Cr) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[&]	E_f	J^π_f
9261.63	1/2$^+$	4491.5 *4*	2.1 *4*	4769.6	1/2$^-$,3/2$^-$
		4625.0 *4*	3.7 *7*	4637.0	3/2
		4971.6 *7*	1.4 *3*	4289.3	1/2$^+$
		5222.0 *4*	7.7 *10*	4040.0	1/2$^-$
		5490.3 *5*	5.9 *6*	3770.5	1/2$^-$,3/2$^-$
		5494.5 *3*	6.7 *7*	3766.8	1/2$^-$,3/2$^-$
		6135.9 *4*	30.0 *7*	3125.9	3/2$^-$
9261.63	1/2$^+$	6206.3 *5*	0.7 *2*	3055.9	1/2$^-$
		6371.6 *5*	13.3 *13*	2890.2	3/2$^-$
		6433.7 *8*	0.33 *17*	2828.5	(3/2)$^-$
		7362.6 *6*	41.4 *4*	1899.2	3/2$^-$
		8484.2 *7*	87 *10*	776.95	1/2$^-$
		8512.2 *7*	100.0 *13*	749.10	3/2$^-$

† From ^{51}Mn ε decay and ^{48}Ti(α,nγ), except as noted.

‡ From ^{50}Cr(n,γ), (pol n,γ).

From ^{51}V(p,nγ).

@ From (HI,xnγ).

& Relative photon branching from each level. Values are weighted average of all available sources, except as noted.

a From ^{48}Ti(α,nγ), except as noted.

b From comparison to RUL.

c From (α,nγ) and (n,γ).

d From (α,nγ). The 1539γ and 2704γ are multiply placed in (p,nγ).

e Iγ=151 *6* in (p,nγ); therefore, part of 2379γ in (p,nγ) probably belongs elsewhere.

f Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

g Multiply placed with undivided intensity.

h Multiply placed with intensity suitably divided.

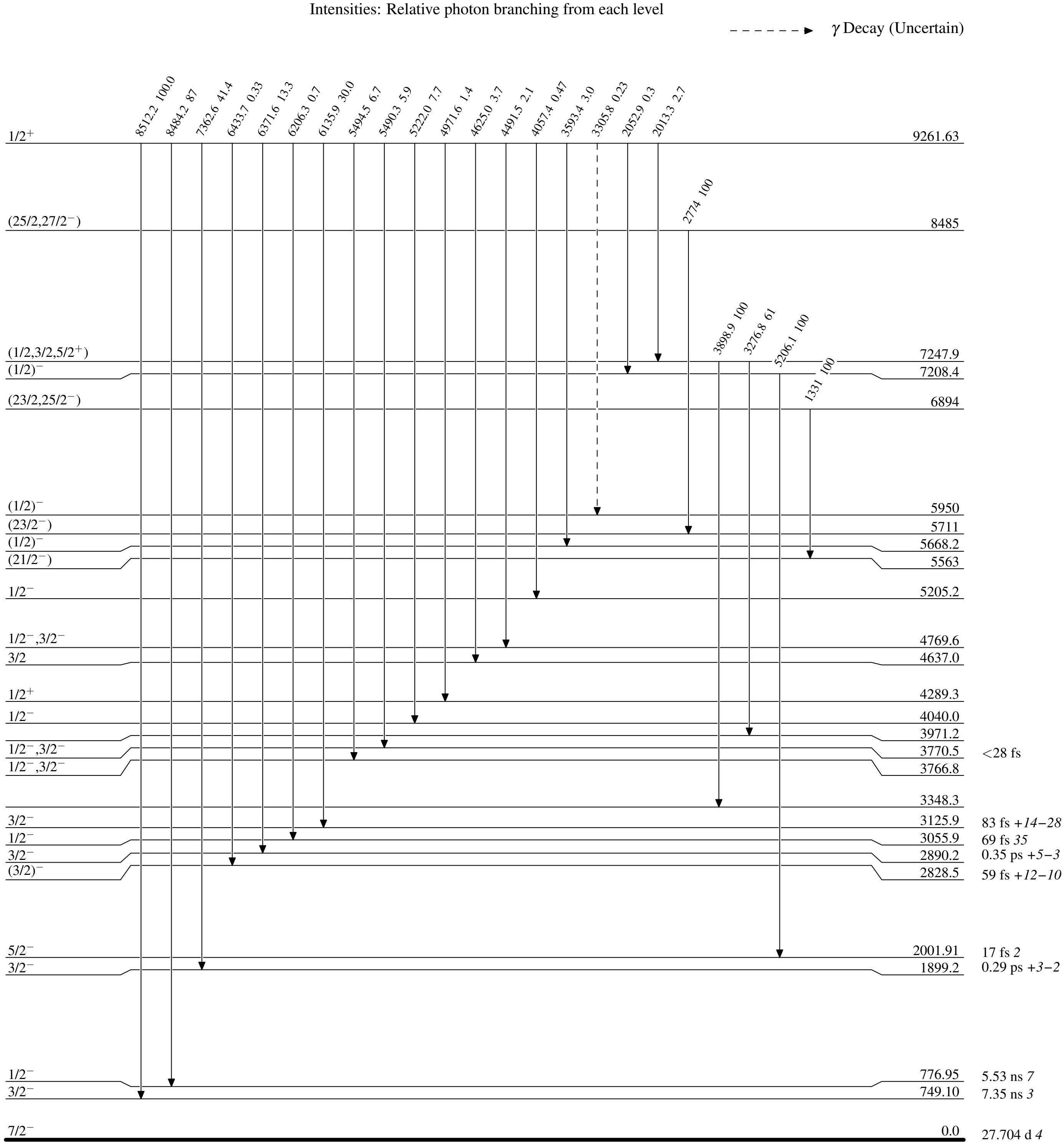
i Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

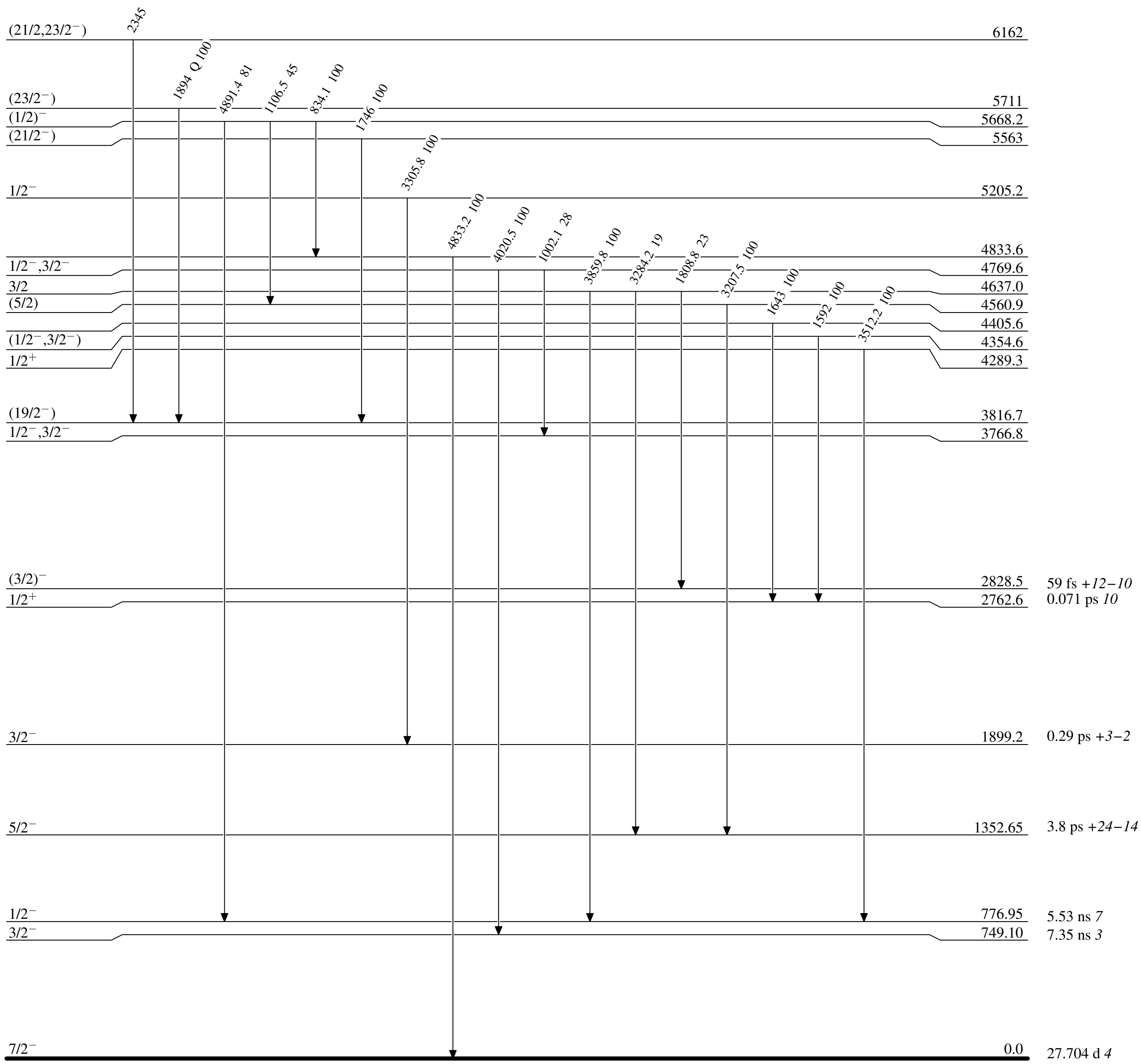


$^{51}_{24}Cr_{27}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{51}_{24}Cr_{27}$

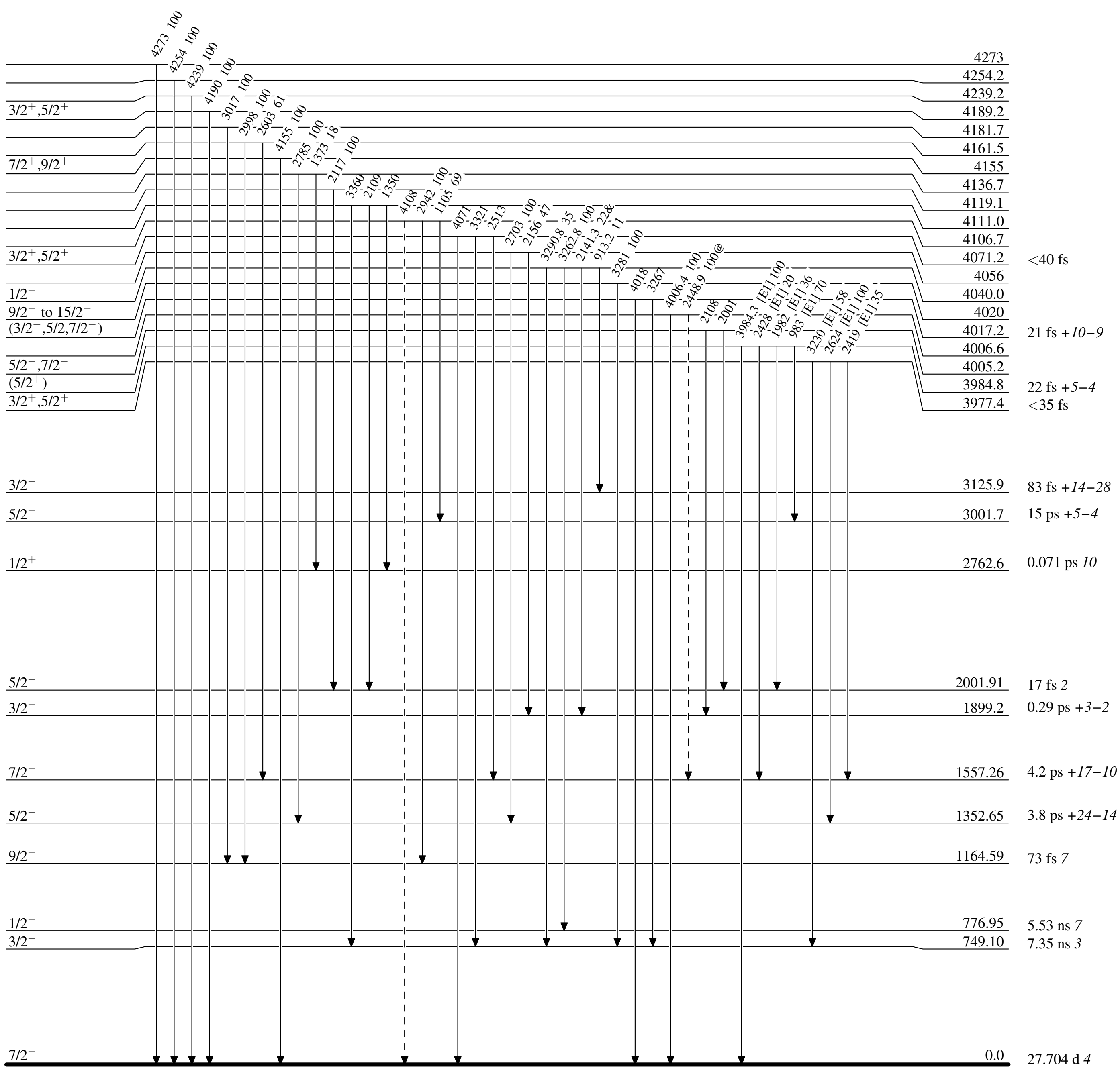
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend

γ Decay (Uncertain)

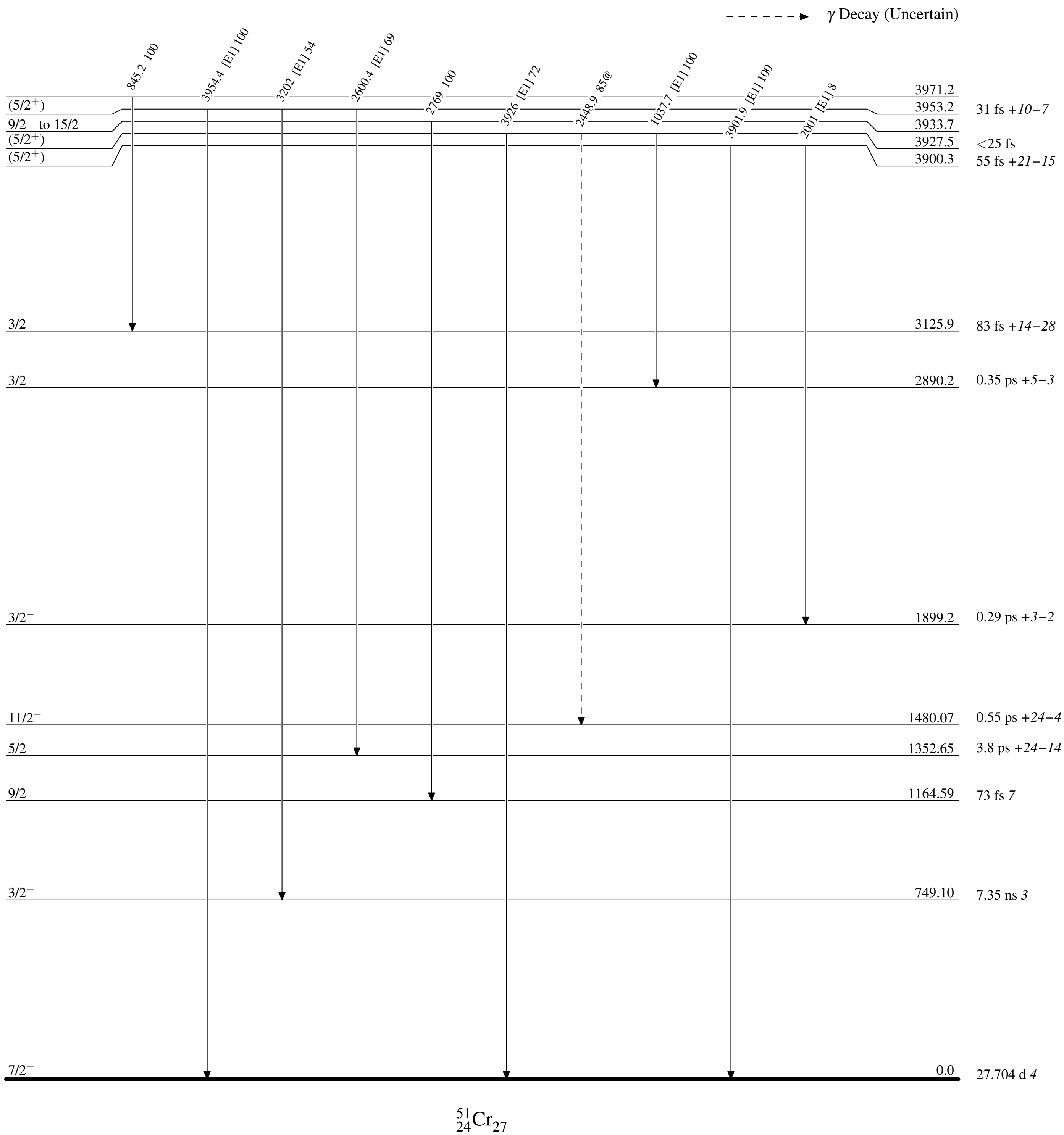


$^{51}_{24}Cr_{27}$

Adopted Levels, Gammas

Level Scheme (continued)

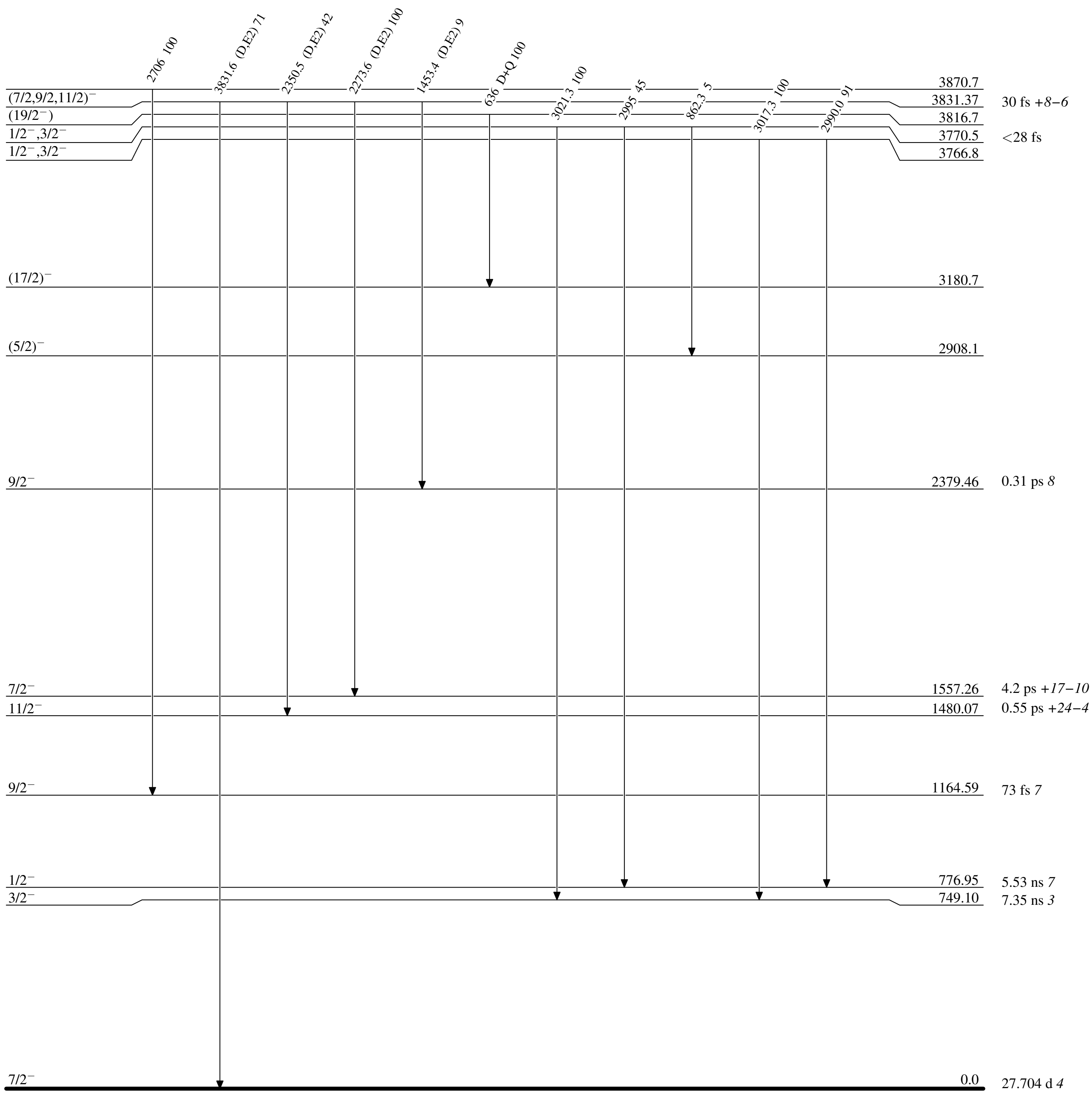
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

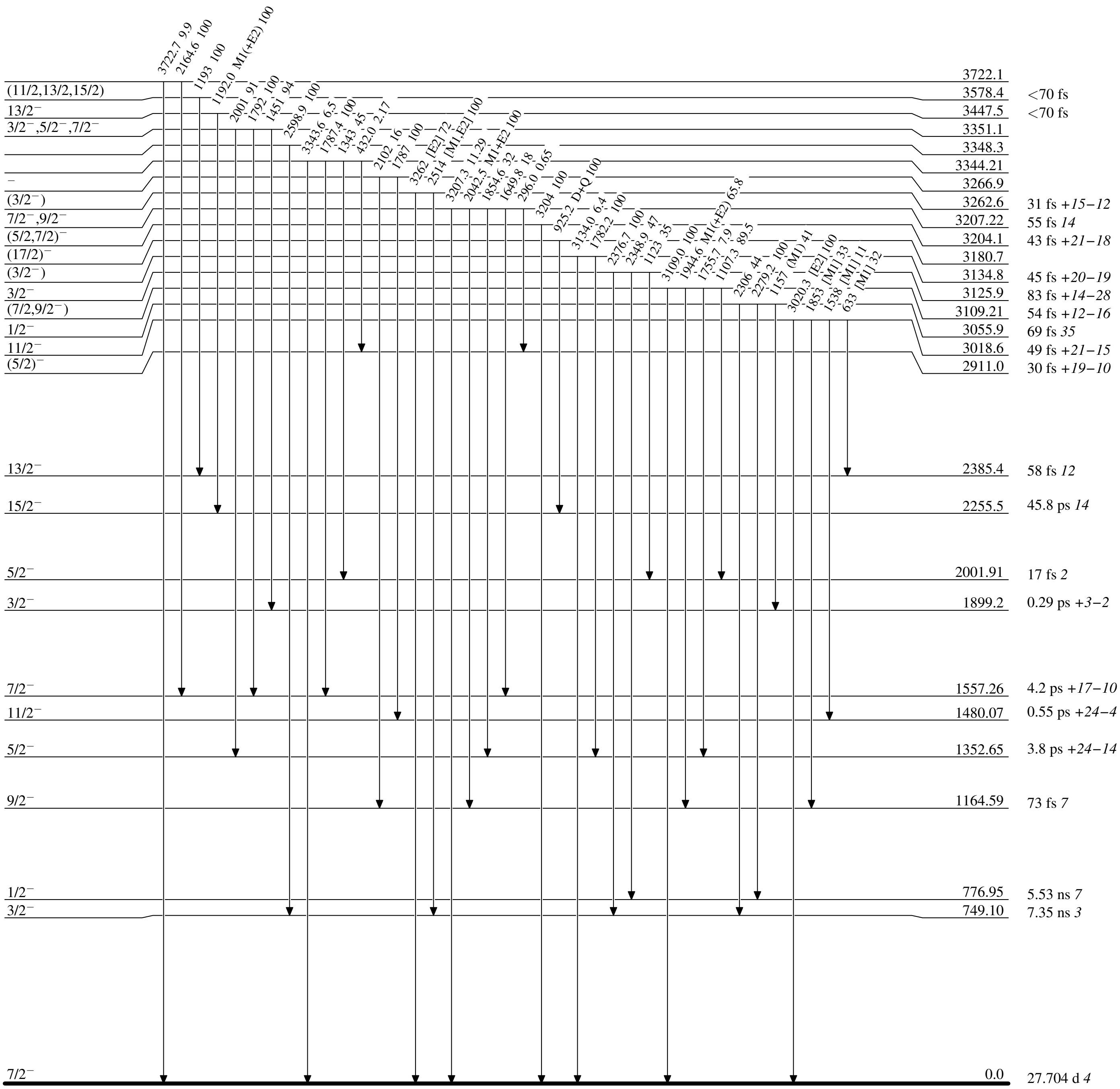


$^{51}_{24}Cr_{27}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided



$^{51}_{24}Cr_{27}$

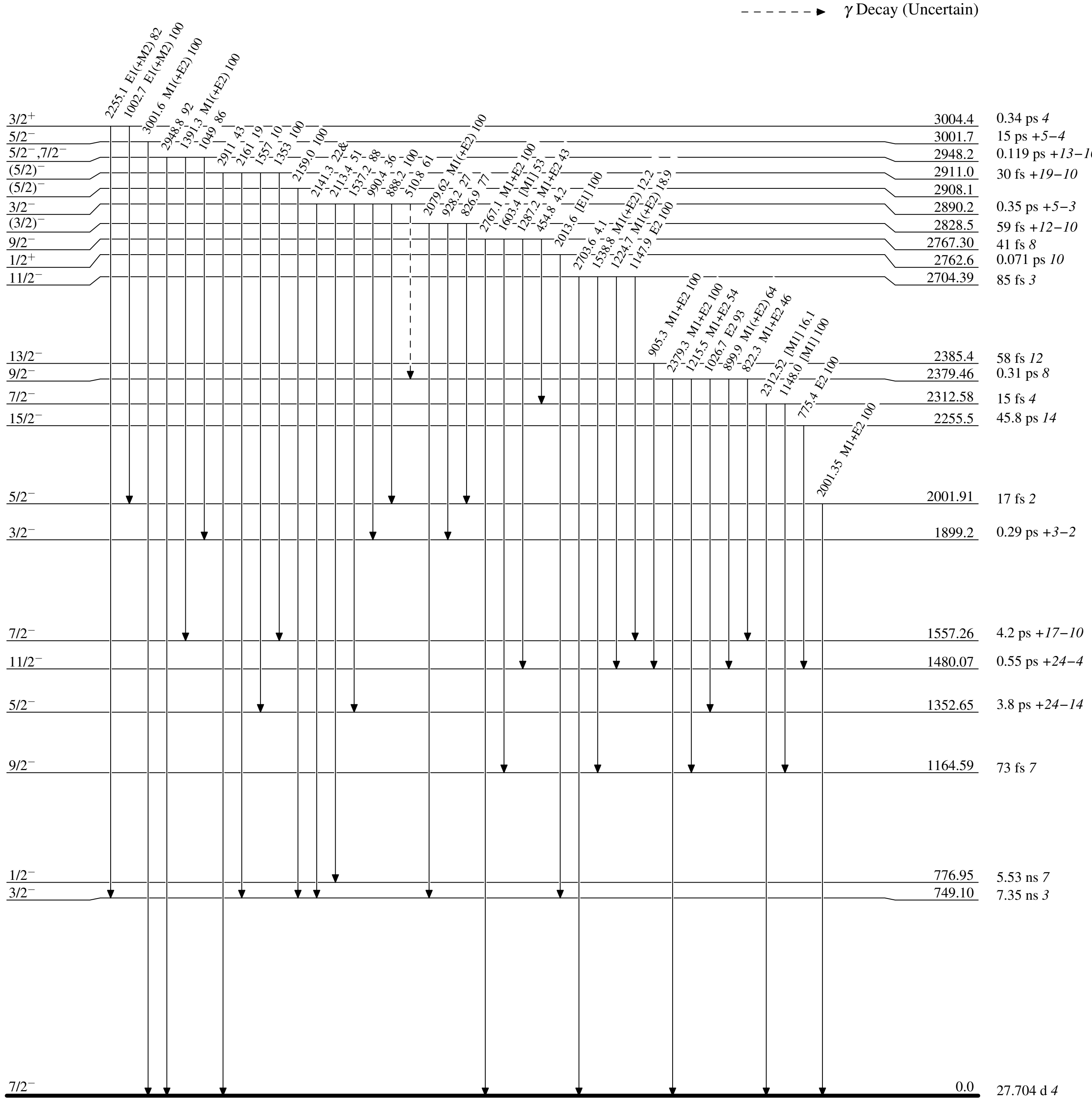
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

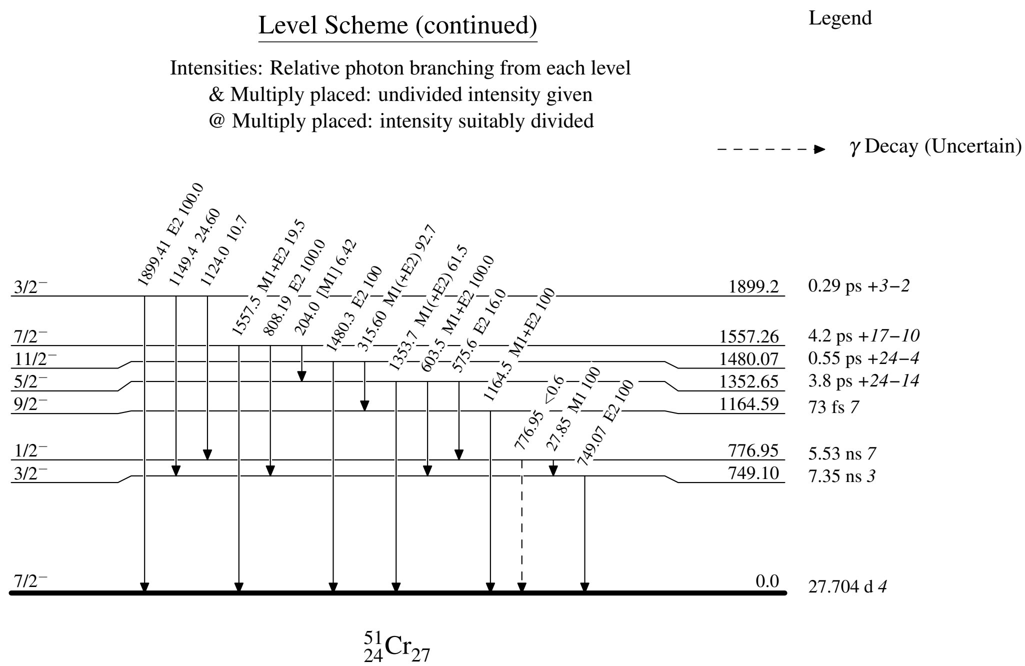
Legend

γ Decay (Uncertain)

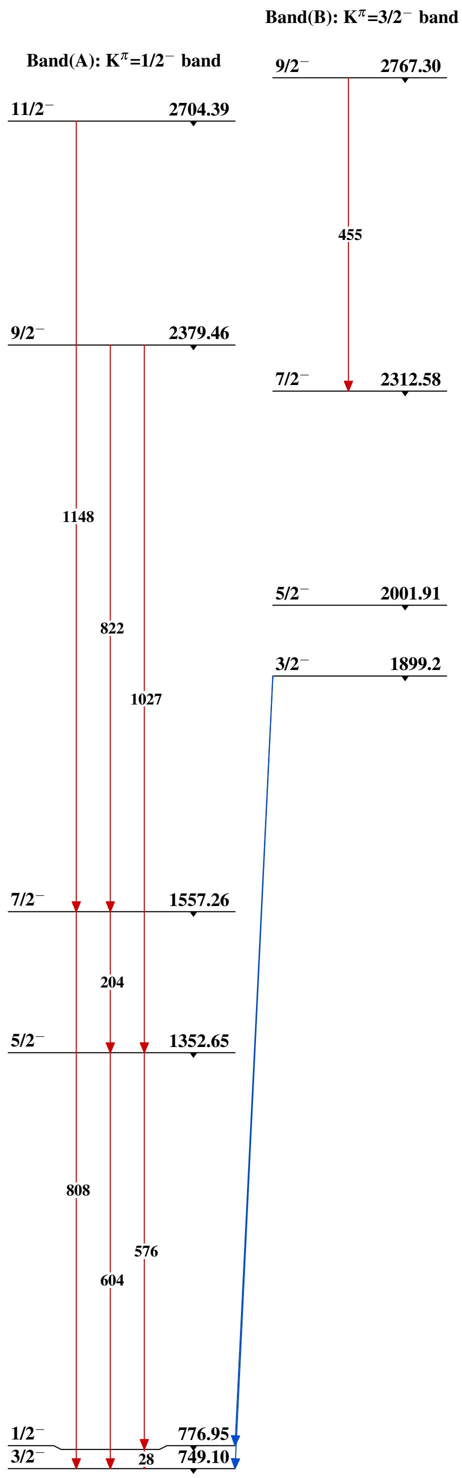


$^{51}_{24}Cr_{27}$

Adopted Levels, Gammas

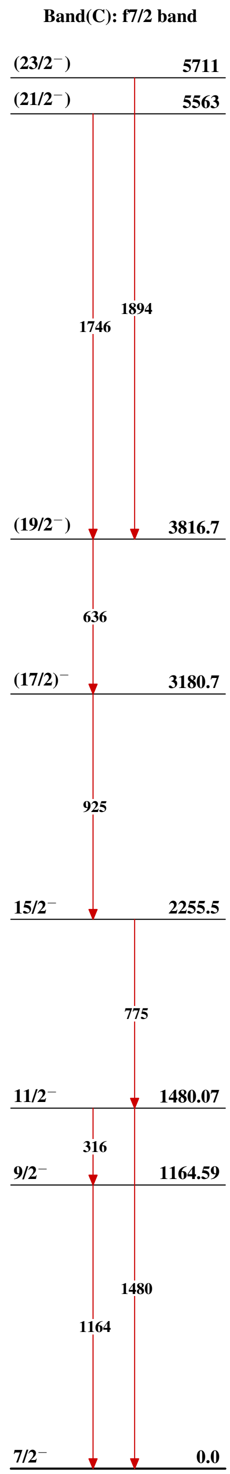


Adopted Levels, Gammas



$^{51}_{24}Cr_{27}$

Adopted Levels, Gammas (continued)



$^{51}_{24}Cr_{27}$