Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yang Dong, Huo Junde	NDS 128, 185 (2015)	10-Jul-2015

Q(β^-)=−4711.2 *19*; S(n)=12038.4 *9*; S(p)=10503.4 *9*; Q(α)=−9351.3 *6* 2012Wa38

Other reactions: ^{48}Ti(α,γ) E=6-12 MeV, 1976Fo04; ^{48}Ti(^{16}O,^{12}C) E=120 MeV (1979Da07); ^{53}Cr(^{12}C,^{13}C) E=18.5-33 MeV (1974PaZZ); ^{54}Fe(^{18}O,^{20}Ne) E=48,50 MeV (1972SiYD,1975PeZM).

^{52}Cr Levels

Cross Reference (XREF) Flags

A	^{52}V β^- decay (3.743 min)	M	^{52}Cr(γ,γ'),(pol γ,γ')	Y	^{52}Cr(^{16}O,^{16}O′),(^{18}O,^{18}O′)
B	^{52}Mn ε decay (5.591 d)	N	^{52}Cr(e,e′)	Z	Coulomb excitation
C	^{52}Mn ε decay (21.1 min)	O	^{52}Cr(π^+,π^+),(π^+,$\pi^{+\prime}$)	Others:	
D	(HI,xnγ)	P	^{52}Cr(n,n′)	AA	^{50}Cr(α,^{2}He)
E	^{50}Ti(^{3}He,n)	Q	^{52}Cr(n,n′γ)	AB	^{53}Cr(p,d)
F	^{52}Cr(p,p′γ)	R	^{50}V(α,d)	AC	^{53}Cr(d,t),(pol d,t)
G	^{52}Cr(p,p′)	S	^{50}Ti(^{16}O,^{14}C)	AD	^{53}Cr(^{3}He,α)
H	^{50}Cr(t,p)	T	^{52}Cr(d,d′)	AE	^{54}Cr(p,t)
I	^{51}V(p,γ) E=res:IAR	U	^{52}Cr(^{3}He,^{3}He′)	AF	^{55}Mn(μ^-,3nγ)
J	^{51}V(^{3}He,d)	V	^{52}Cr(α,α')	AG	^{51}V(α,t)
K	^{51}V(^{3}He,dγ)	W	^{52}Cr(^{7}Li,^{7}Li′)	AH	^{56}Fe(d,^{6}Li)
L	^{55}Mn(p,α)	X	^{52}Cr(^{12}C,^{12}C′),(^{13}C,^{13}C′)	AI	Ni(K$^-$,x rayγ),(π^+,xγ),(π^-,Xγ)

E(level)[†]	J$^\pi$	T$_{1/2}$[m]	XREF	Comments
0.0[p]	0$^+$	stable	ABCDEFGHIJKLMNO Q S UVWXYZ	XREF: Others: AA, AB, AC, AD, AE, AF, AG, AH, AI rms charge radius=3.6424 fm *21* (2004An14). others: rms charge radius=3.61 fm *8*, muonic x-ray (1962Jo05), rms charge radius=3.674 fm *15* (1976Li19) (e,e′).
1434.091[p] *14*	2$^+$	0.783 ps *21*	ABCDEFGHIJKLMNOPQ STUVWXYZ	XREF: Others: AB, AC, AD, AE, AF, AG, AH, AI μ=+2.41 *13* (2000Er01) Q=−0.082 *16* (1989Ra17) J$^\pi$: E2 γ to 0$^+$. T$_{1/2}$: From Coulomb Ecitation. Other: 0.69 PS +31-17 (^{3}He,dγ) and>0.49 ps (n,nγ). μ: Others: +3.0 *5* (1987St07) and +3.2 *22* (1987Pa28).
2369.630[p] *18*	4$^+$	6.7 ps *+35−17*	ABCD FG IJKL NOPQ ST VW Z	XREF: Others: AB, AC, AD, AE, AF, AG, AH B(E4)↑=0.00066 *8* XREF: K(2368)L(2371)T(2372)AD(2380). J$^\pi$: L(α,α')=4. B(E4)↑: from weighted average of 0.00067 *12* in (e,e′) and 0.00066 *10* in (π^+,π^+),(π^+,$\pi^{+\prime}$). T$_{1/2}$: From DSAM (Coulomb Ecitation). Others: 9.4 ps *+24−16*, DSAM (HI,xnγ), 1.04 PS *+35−17* (^{3}He,dγ) DSAM.
2646.9 *6*	0$^+$		A FGH L NO Q S V	XREF: Others: AB, AC, AE, AH XREF: H(2660)L(2650)N(2650)O(2650)S(2640)V(2650) AC(2640)AH(2650). J$^\pi$: L(p,p′)=L(e,e′)=L(t,p)=L(p,t)=0.
2767.767 *21*	4$^+$	1.9 ps *5*	ABCD FG IJKL NO Q ST VW	XREF: Others: AA, AB, AC, AD, AE, AG XREF: N(2770)O(2770)V(2770)AA(2770)AC(2770)AD(

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Adopted Levels, Gammas (continued)

^{52}Cr Levels (continued)

E(level)[†]	J^π	$T_{1/2}$[m]	XREF	Comments
				J^π: L(α,α')=4. $T_{1/2}$: DSAM, from weighted average of values 1.4 ps +5−3 (^{3}He,dγ) and 2.5 ps 6 (HI,xnγ).
2964.786 17	2^+	0.42 ps 8	A C FGHIJKL NO Q ST V	XREF: Others: AB XREF: H(2974)N(2970)O(2960)V(2960). J^π: E2 γ to 0^+. $T_{1/2}$: from (p,p'γ). Others: 0.47 ps +22−13, DSAM (^{3}He,dγ), 0.42 ps 21 (n,n'γ).
3113.858[p] 21	6^+	41.4 ps 14	B D G IJKL N Q S VW	XREF: Others: AA, AB, AG, AH XREF: N(3110)V(3110)AA(3110)AG(3110)AH(3110). J^π: L(p,p')=6, E2 γ to 4^+. $T_{1/2}$: RDM. Other: >1.8 ps (^{3}He,dγ), DSAM.
3161.74 6	2^+	0.035[n] ps 7	A C FGHI KLMNO Q VW	XREF: Others: AB, AE, AH XREF: H(3175)AE(3168). J^π: L(α,α')=2. $T_{1/2}$: Others: 0.08 ps +4−3 (^{3}He,dγ) and 33 fs 5 (p,p'γ).
3415.32[q] 3	4^+	0.26 ps 7	AB D FG IJKL O Q V	XREF: Others: AB, AD XREF: J(3420)O(3420)V(3450)AB(3432)AD(3418). J^π: L(p,p')=4. $T_{1/2}$: from weighted average of values 0.22 ps +8−5 (^{3}He,dγ) and 0.33 ps 9 (HI,xnγ).
3472.25 15	3^+	7.2 ps 8	A CD FG I KL Q S	XREF: Others: AB, AC, AD, AG XREF: S(3440)AB(3494)AC(3460)AG(3440). J^π: 1968Mo19 propose the existence of two levels in this vicinity separated by 3.0 keV, one decaying by 703γ and having a spin of 3, 5 (from p,p'$\gamma(\theta)$), and another with spin 2 decaying by 2038γ. Subsequent work (1977Ya08, 1974Br04) shows that a single level at 3472.2 emits two γ's (704.6 (78%) and 2038.0 (22%)) and suggests that the two-level hypothesis was a result of an error in the energy assigned to the 704γ by 1968Mo19. Furthermore, the p,p'$\gamma(\theta)$ data on the 2038γ (1968Mo19) were found to be consistent with 3. $T_{1/2}$, together with L in transfer, suggest π=+. One further complication is the assignment of L=4 to the level by 1970Pr08 in (p,p'). L(p,p')=2+3. Thus existence of a $J^\pi=4^+$ level at 3472 is tentatively ruled out. $T_{1/2}$: RDM. Other: >1.9 ps (^{3}He,dγ), DSAM, GT 0.49 ps (n,n'γ).
3615.924 22	5^+	2.6 ps 12	B D G IJKL	XREF: Others: AB XREF: J(3620)L(3619). J^π: log *ft*=6.15 from 6^+, $\gamma(\theta)$ in (HI,xnγ); π from L(^{3}He,d)=1. $T_{1/2}$: from 1.4 ps<$T_{1/2}$<3.8 ps, lower limit, DSAM; upper, RDM. Other: >0.76 ps in (^{3}He,dγ), and 0.10 ps 7 (n,n'γ).
3739.6[a]	$1^+,1^-,2^+$		M	J^π: From (γ,γ') (1998En05), based on values of reduced transition strengths(↑).
3771.72 14	2^+	9 fs 2	A C EFGH JKLMNO Q S V	XREF: Others: AB, AC, AD, AG XREF: E(3700)H(3781)S(3780)V(3780)AB(3767)AC

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Adopted Levels, Gammas (continued)

^{52}Cr Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[m]	XREF	Comments
				Jπ: L(α,α′)=2, L(^{3}He,d)=1. B(E2)↑=0.0071 *8* (2007En02). $T_{1/2}$: from weighted average of values 9 fs *3* (n,n′γ) and 9 fs *4* (p,p′γ).
3947.5 *6*	2^+	0.014[n] ps *7*	G I KL Q	XREF: Others: AB XREF: G(3949)AB(3926). Jπ: L(p,p′)=2, $T_{1/2}$: other: 0.10 ps *+4−3* (^{3}He,dγ).
3951.2 *10*	2^+		C GH J	XREF: G(3949)H(3957). Jπ: L(p,p′)=2, L(^{3}He,d)=1 from $7/2^-$.
4015.51[q] *3*	5^+	0.61 ps *+27−19*	B D G IJKL	XREF: Others: AD XREF: J(4020)AD(4017). Jπ: log *ft*=6.6 from 6^+, π from L(^{3}He,d)=1. $T_{1/2}$: from weighted average of values 0.58 ps *+32−19* (^{3}He,dγ) and 0.7 ps *5* (HI,xnγ).
4039.1 *11*	4^+	26[n] fs *4*	D G IJKL NO V	XREF: Others: AB XREF: J(4033)V(4010)AB(4030). Jπ: L(p,p′)=L(α,α′)=4. $T_{1/2}$: other: 0.51 ps *+25−14* (^{3}He,dγ).
4.10×10^3[c] *10*	3^-		P	XREF: Others: AC, AG XREF: P(4200)AC(4090). Jπ: L(n,n′)=3.
4470	3^-		U	E(level): from (^{3}He,^{3}He′). Jπ: L(^{3}He,^{3}He′)=3.
4563.0 *8*	3^-	40[n] fs *6*	C GH JKL NOPQ S V X	B(E3)↑=0.0066 *3* XREF: H(4572)P(4600)V(4560). Jπ: L(α,α′)=L(e,e′)=3. $T_{1/2}$: other: 0.27 ps *+12−6* (^{3}He,dγ). B(E3) from weighted average of values 0.0065 *4* in (e,e′) and 0.0068 *5* in (π^+,π^+),(π^+,$\pi^{+\prime}$).
4584.0 *7*	(6^+)		D	Jπ: From (HI,xnγ), γ to 6^+.
4611	$(3,4)^+$		I	XREF: Others: AD XREF: AD(4605). Jπ: L(^{3}He,α)=3 on $3/2^-$.
4627.32 *19*	4^+		B G J L O	XREF: Others: AG XREF: G(4630)L(4630)O(4630)AG(4680). Jπ: L(p,p′)=4.
4702 *5*	2^+		E G J L O	XREF: E(4710)L(4706)O(4710). Jπ: L(^{3}He,n)=2.
4730[f]	4^+		J V	Jπ: L(α,α′)=4. L(^{3}He,d)=1.
4742.3 *11*	0^+		GHI L S	XREF: G(4738)H(4745). Jπ: L(t,p)=0.
4750.31[p] *20*	8^+	0.08[n] ps *10*	D QR	XREF: Others: AA XREF: AA(4770). $T_{1/2}$: Other: 0.64 ps *+20−17* (HI,xnγ). Jπ: γ(θ) in (HI,xnγ), E2 γ to 6^+.
4800.1[a]	$1^+,1^-,2^+$		M	Jπ: From (γ,γ′) (1998En05).
4805.96[q] *24*	6^+	0.49 ps *+28−14*	D G I L	XREF: Others: AA XREF: I(4808)L(4808)AA(4770). Jπ: L(α,^{2}He)=4,6, γ(θ) in (HI,xnγ), M1+E2 γ to 5^+.
4815.69 *9*	$1^+,2^+$		C	XREF: Others: AD XREF: ad(4830). Jπ: log *ft*=5.55 from 2^+, γ to 0^+.
4841.3[a] *11*	$1^+,1^-,2^+$		G IJ LM	XREF: Others: AD

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Adopted Levels, Gammas (continued)

^{52}Cr Levels (continued)

E(level)[†]	J^π	$T_{1/2}$[m]	XREF	Comments
				XREF: G(4832)ad(4830). J^π: From (γ,γ') (1998En05).
4951 *4*	4^+		G L S	XREF: L(4950)S(4980). J^π: L(p,p′)=4.
5054.3 *11*	4^+		I V	XREF: V(5070). J^π: L(α,α')=4.
5095 *5*	4^+		G J L V	XREF: Others: AG XREF: V(5070)AG(5120). J^π: L(^{3}He,d)=L(α,t)=1, L(p,p′)=L(α,α')=4.
5098.6[a] *4*	1	0.045[o] eV *10*	I M	J^π: excitation in (γ,γ').
5139 *5*	(6^+)		G J L	J^π: L(p,p′)=5,6, L(^{3}He,d)=(3) from $7/2^-$.
5213.7[a] *5*	1	0.013[o] eV *3*	G LM S	J^π: excitation in (γ,γ').
5285 *5*			G J L	XREF: L(5281). J^π: L(^{3}He,d)=0 from $7/2^-$, L(p,p′)=5,6.
5346 *4*	$4^+,6^+$		G L	XREF: Others: AA XREF: AA(5320). J^π: L(α,^{2}He)=4,6.
5396.9[q] *3*	7^+	0.14 ps *+12−9*	D	J^π: $\gamma(\theta)$ in (HI,xnγ), M1+E2 γ to 6^+, E2 γ to 5^+.
5410 *4*	(2^+)		GH j L	XREF: Others: AD XREF: H(5423)j(5420)AD(5400). J^π: L(t,p)=(2).
5425 *5*	4^+		G j L	XREF: j(5420)L(5422). J^π: L(p,p′)=4.
5432 *6*			G	
5446.4 *5*	4^+		HIJ L V	XREF: Others: AG XREF: H(5443)J(5450)L(5450)V(5450)AG(5450). J^π: L(α,α')=4.
5490.8[a]	$1^+,1^-,2^+$		g LM	XREF: g(5494). J^π: excitation in (γ,γ').
5500[b]	3^-		g N	XREF: g(5494). J^π: L(e,e′)=3.
5526.0[a] *5*	1	0.016[o] eV *3*	M	J^π: excitation in (γ,γ').
5541 *5*	4^+		G L	XREF: L(5538). J^π: L(p,p′)=4.
5544.7[a] *10*	(1^+)	0.112[o] eV *7*	G LM	XREF: Others: AD XREF: G(5546)AD(5560). J^π: L(^{3}He,α)=(1) from $3/2^-$, D γ to 0^+.
5563.5 *8*	$^+$		G I L	XREF: G(5569)L(5571). J^π: L(^{3}He,d)=1 from $7/2^-$.
5584 *6*	$^+$		G J L	XREF: J(5594). J^π: L(^{3}He,d)=1 from $7/2^-$.
5600[#] *15*	0^+		E H	XREF: E(5650). J^π: L(t,p)=L(3He,n)=0.
5633.4 *11*	(8^+)		D V	XREF: V(5640). J^π: From (HI,xnγ), γ to (6^+).
5664.4 *11*	$(2)^+$		G IJ L	XREF: Others: AD XREF: G(5661)J(5660)AD(5670). J^π: L(p,p′)=2. L(^{3}He,d)=1+3 from $7/2^-$.
5725.3 *12*	$^+$		G IJ L S	XREF: Others: AD XREF: G(5727)J(5720)S(5700)AD(5710). J^π: L(^{3}He,α)=3 from $3/2^-$.
5737.5 *11*	(4^+)		G I	J^π: L(p,p′)=(4).
5755[#] *15*	$^+$		H j	XREF: j(5751). J^π: L(t,p)=0. But L(^{3}He,d)=1 from $7/2^-$.

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Adopted Levels, Gammas (continued)

^{52}Cr Levels (continued)

E(level)[†]	J$^\pi$	T$_{1/2}$[m]	XREF	Comments
5796.0[a]	1$^+$,2$^+$		G J LM	XREF: J(5790). J$^\pi$: 1,2$^+$ from excitation in (γ,γ'), PI=− ruled out by L(^{3}He,d)=1+3 from 7/2$^-$.
5811 *5*	5,6$^+$		G	J$^\pi$: L(p,p′)=5,6.
5818 *6*			G	
5824.7[q] *4*	8$^+$	1.0 ps *+6−4*	D	J$^\pi$: $\gamma(\theta)$ in (HI,xnγ), M1+E2 γ to 7$^+$.
5860.5 *11*	+		G IJ	XREF: Others: AG XREF: G(5853)J(5828)AG(5830). J$^\pi$: L(^{3}He,d)=L(α,t)=1 from 7/2$^-$.
5865 *6*			G	
5873 *5*	3$^-$		G	J$^\pi$: L(p,p′)=3.
5891[&]	3$^-$,4$^-$		J V	XREF: V(5910). J$^\pi$: L(^{3}He,d)=0 from 7/2$^-$.
5919 *5*	5,6$^+$		G	J$^\pi$: L(p,p′)=5,6.
5953 *5*	2$^+$		G J S	XREF: J(5945). J$^\pi$: L(p,p′)=2.
5960 *5*			G	
5996 *5*	3$^-$		G J L	XREF: Others: AA XREF: J(5992)AA(5990). J$^\pi$: L(p,p′)=3.
6026 *6*	+		GH J	J$^\pi$: L(^{3}He,d)=1 from 7/2$^-$.
6035.3 *12*			G I	
6055 *5*	2$^+$		G	J$^\pi$: L(p,p′)=2.
6065 *7*			GH	XREF: H(6069).
6106 *6*	0$^+$		E G J S	XREF: E(6100)J(6089)S(6130). J$^\pi$: L(^{3}He,n)=0.
6137.0[a] *10*	2$^+$		G M	J$^\pi$: L(p,p′)=2. Excitation in (γ,γ').
6153 *8*	2$^+$		GH	J$^\pi$: L(t,p)=2.
6164 *12*	3$^-$		G V	XREF: V(6160). J$^\pi$: L(α,α')=3.
6175 *7*	2$^+$		G	XREF: Others: AD XREF: AD(6180). J$^\pi$: L(p,p′)=2.
6193 *6*	+		G J	J$^\pi$: L(^{3}He,d)=1 from 7/2$^-$.
6205.4 *12*			G I	
6210 *10*			G	
6220 *6*			G	
6233 *10*	+		G J	J$^\pi$: L(^{3}He,d)=1 from 7/2$^-$.
6243 *5*	3$^-$		G	J$^\pi$: L(p,p′)=3.
6252 *6*			G	
6272 *6*			G	
6293 *7*			G	
6324 *10*			G S	XREF: S(6330).
6349 *5*	+		G J	XREF: J(6364). J$^\pi$: L(^{3}He,d)=1 from 7/2$^-$.
6356.6 *12*	(9$^+$)		D	J$^\pi$: $\gamma(\theta)$ in (HI,xnγ).
6365.3[p] *11*	(10$^+$)		D	J$^\pi$: $\gamma(\theta)$ in (HI,xnγ).
6375.4 *12*			G I	XREF: G(6372).
6381.0 *10*	(6$^+$)		D	J$^\pi$: From $\gamma(\theta)$ in (HI,xnγ).
6389.9[a] *5*	1$^+$	0.069[o] eV *7*	G J LM	XREF: J(5790). J$^\pi$: 1 from excitation in (γ,γ'), PI=− ruled out by L(^{3}He,d)=1 from 7/2$^-$.
6392 *10*	3$^-$		G	J$^\pi$: L(p,p′)=3.
6426 *5*			G	
6437 *10*			G	

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Adopted Levels, Gammas (continued)

^{52}Cr Levels (continued)

E(level)[†]	J^π	$T_{1/2}$[m]	XREF	Comments
6453.4[q] *4*	9^+	0.14 ps *+9−8*	D	J^π: $\gamma(\theta)$ in (HI,xnγ), M1+E2 γ to 8^+.
6462.4[a] *5*	1	0.074[o] eV *7*	G M	J^π: From excitation in (γ,γ').
6482 *5*	5,6^+		G	J^π: L(p,p′)=5,6.
6493[e] *10*	2^+		G J S	XREF: Others: AD XREF: J(6500)AD(6490). J^π: L(p,p′)=2. L(^{3}He,α)=0 from $3/2^-$.
6495.5[a] *5*	1	0.131[o] eV *9*	M	J^π: From excitation in (γ,γ').
6541 *10*	3^-		G V	J^π: L(α,α')=3.
6568 *10*			G	
6580 *5*			G J N	XREF: J(6610)N(6600).
6637 *5*			G J	XREF: J(6625).
6678 *5*	+		E G J	XREF: E(6670). J^π: L(^{3}He,n)=0, L(^{3}He,d)=1 from $7/2^-$.
6700[g] *20*	−			XREF: Others: AD J^π: L(^{3}He,α)=2 from $3/2^-$.
6704 *5*	5,6^+		G J	XREF: J(6720). J^π: L(p,p′)=5.
6752.0[a] *5*	1^+	0.089[o] eV *10*	J M S V	XREF: J(6760)S(6740)V(6760).
6795.4 *12*	3^-		G I O	XREF: G(6786). J^π: L(p,p′)=3.
6810 *30*	2^+		G J	XREF: Others: AA, AD XREF: J(6814)AA(6800)AD(6790). J^π: L(p,p′)=2.
6871 *5*	5^-		G	J^π: L(p,p′)=5.
6894[&]	+		J	J^π: L(^{3}He,d)=1 from $7/2^-$.
6928[&]	+		J	J^π: L(^{3}He,d)=1 from $7/2^-$.
6956 *5*	5,6^+		G	J^π: L(p,p′)=5,6.
6993 *5*	3^-		G J S	J^π: L(p,p′)=3.
7014.5[a] *4*	1	0.210[o] eV *30*	M	
7030[b] *10*	1^+		J N	XREF: J(6993). J^π: Dipole excitation in (e,e′). PI=− ruled out by L(^{3}He,d)=1 from $7/2^-$.
7090.8[a] *5*	1^+	0.062[o] eV *11*	G J M	J^π: from excitation in (γ,γ').
7100[f]	3^-		N V	J^π: L(α,α')=L(e,e′)=3.
7140[i] *7*	+		G N	J^π: M1 excitation in (e,e′). L(p,p′)=4.
7166.2[a] *5*	+	0.054[o] eV *11*	J MN	XREF: N(7170). J^π: M1 excitation in (e,e′). L(^{3}He,d)=1 from $7/2^-$.
7217 *10*	2^+		G J	XREF: J(7210). J^π: L(p,p′)=2.
7223[&]	+		J	J^π: L(^{3}He,d)=1 from $7/2^-$.
7237.9[q] *6*	10^+	0.16 ps *+15−8*	D	J^π: From $\gamma(\theta)$ in (HI,xnγ), M1+E2 γ to 9^+.
7260[b] *10*	+		J N	J^π: L(^{3}He,d)=1+3 from $7/2^-$, but M1, (M2) excitation in (e,e′).
7278 *10*	4^+		G J S	XREF: J(7273)S(7290). J^π: L(p,p′)=4.
7310[&]	+		J	J^π: L(^{3}He,d)=1+3 from $7/2^-$.
7322[&]	+		J	J^π: L(^{3}He,d)=1 from $7/2^-$.
7342[i] *7*	1^+		G J N	XREF: J(7350)N(7340). J^π: M1 excitation in (e,e′). L(p,p′)=2.
7368.8[a] *5*	1^+	0.229[o] eV *18*	J M	J^π: 1 from excitation in (γ,γ'), PI=− ruled out by L(^{3}He,d)=1 from $7/2^-$.
7376 *10*	5^-		G	J^π: L(p,p′)=5.
7395 *10*	5^+		J	XREF: Others: AA

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Adopted Levels, Gammas (continued)

^{52}Cr Levels (continued)

E(level)[†]	J^π	$T_{1/2}$[m]	XREF	Comments
				XREF: J(7400)AA(7390). J^π: L(α,^{2}He)=5,7, L(^{3}He,d)=1 from 7/2$^-$. E(level): From average of values in (^{3}He,d) and (α,^{2}He).
7401.6 *15*	(12^+)		D	J^π: From (HI,xnγ), γ to (10$^+$).
7403.2[a] *5*	1	0.107[o] eV *15*	M	B(M1)=0.069 *10*, B(E1)=0.76×10^{-5} *11*.
7409 *10*	3^-		G O	J^π: L(p,p′)=3.
7450[‡h] *50*	$0^+,2^+$		E	J^π: L(^{3}He,n)=0+2.
7458 *10*	$5,6^+$		G	J^π: L(p,p′)=5,6.
7482 *10*	3^-		G	J^π: L(p,p′)=3.
7487	$+$		J	J^π: L(^{3}He,d)=1 from 7/2$^-$.
7524.1[a] *5*	1^{+}[j]	0.400[o] eV *28*	g j MN	XREF: N(7520). J^π: L(p,p′)=0.
7560[b] *20*	$+$		g j N S	XREF: g(7540)j(7536)S(7570). J^π: from L(^{3}He,d)=1 from 7/2$^-$.
7585 *10*	3^-		G J	J^π: L(p,p′)=3.
7590	$+$		J	J^π: L(^{3}He,d)=1+3 from 7/2$^-$.
7679 *10*	$5,6^+$		G J	XREF: J(7686). J^π: L(p,p′)=5,6, L(^{3}He,d)=1+3 from 7/2$^-$.
7700[b] *10*	1^+		N	J^π: M1 excitation in (e,e′).
7731.9[a] *5*	1^{-}[j]	0.960[o] eV *24*	J M	B(E1)=5.96×10^{-5} *40*. $\Gamma^2_{\gamma 0}/\Gamma$=1.75 eV *32* (1979Ku14).
7738 *10*	3^-		G	J^π: L(p,p′)=3.
7750	$+$		J	XREF: Others: AA XREF: J(7729). J^π: L(^{3}He,d)=1 from 7/2$^-$, L(α,^{2}He)=5,7.
7760[&]	$+$		J	J^π: L(^{3}He,d)=1 from 7/2$^-$.
7810[c]	$-$			XREF: Others: AG J^π: L(α,t)=4.
7820 *10*	1^+		G J	XREF: J(7815). J^π: M1 excitation in (e,e′).
7823[&] *10*	3^-		G	J^π: L(p,p′)=3.
7854[i] *7*	4^+		G J N S	XREF: G(7848)N(7860)S(7870). J^π: L(p,p′)=4. L(^{3}He,d)=1 from 7/2$^-$.
7865.1[a] *5*	1^+	0.435[o] eV *27*	M	
7889.0[a] *5*	1	0.480[o] eV *45*	M	J^π: from excitation in (γ,γ').
7893 *10*	4^+		G J	XREF: J(7905). J^π: L(p,p′)=4. L(^{3}He,d)=1 from 7/2$^-$.
7897.4[a] *5*	1^{-}[j]	3.38[o] eV *17*	M	J^π: π based on asymmetries for different g.s. dipole transition in (γ,γ').
7900[b]	3^-		N V	J^π: L(e,e′)=3.
7920[&]	$+$		J	J^π: L(^{3}He,d)=1 from 7/2$^-$.
7930[‡] *50*	$+$		E J	XREF: J(7967). J^π: L(^{3}He,n)=0, L(^{3}He,d)=1 from 7/2$^-$.
7967 *10*	3^-		G	J^π: L(p,p′)=3.
8010	$+$		G J	XREF: Others: AG XREF: J(7967). J^π: L(^{3}He,d)=1 from 7/2$^-$, L(α,t)=4 from 7/2$^-$.
8015.4[a] *4*	1	0.260[o] eV *59*	M	B(M1)=0.131 *30*, B(E1)=1.45×10^{-5} *33*.
8022 *10*	2^+		G J	J^π: L(p,p′)=2 and L(^{3}He,d)=1 from 7/2$^-$.
8083	$+$		J MN	XREF: N(8080). J^π: L(^{3}He,d)=1 from 7/2$^-$.
8087[&] *9*	3^-		G	J^π: L(p,p′)=3.

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Adopted Levels, Gammas (continued)

^{52}Cr Levels (continued)

E(level)[†]	J$^{\pi}$	$T_{1/2}$[m]	XREF	Comments
8091.3[a] *5*	1	0.734[o] eV *44*	M	J$^{\pi}$: from excitation in (γ,γ').
8100 *20*	8$^-$		N	J$^{\pi}$: M8 excitation in (e,e$'$).
8121 *10*	+		G J	XREF: J(8130). J$^{\pi}$: L(^{3}He,d)=1 from 7/2$^-$, L(p,p$'$)=0.
8179.3[a] *4*	1$^+$	0.90[o] eV *18*	G J M O	XREF: J(8183). J$^{\pi}$: L(p,p$'$)=0.
8190[c]	+			XREF: Others: AG J$^{\pi}$: L(α,t)=4 from 7/2$^-$.
8213 *10*	0$^+$		G	J$^{\pi}$: L(p,p$'$)=0.
8216.4[q] *9*	11$^+$	0.24 ps *+17−9*	D J	XREF: J(8234). J$^{\pi}$: from $\gamma(\theta)$ in (HI,xnγ), M1+E2 γ to 10$^+$, E2 γ to 9$^+$.
8250[&]	+		J	J$^{\pi}$: L(^{3}He,d)=1+3 from 7/2$^-$.
8281[e] *10*	3$^-$		G	J$^{\pi}$: L(p,p$'$)=3.
8283	+		J	J$^{\pi}$: L(^{3}He,d)=1 from 7/2$^-$.
8337[e] *10*	(4$^+$)		G J	XREF: J(8330). J$^{\pi}$: L(p,p$'$)=4,5, L(^{3}He,d)=1+3 from 7/2$^-$.
8350[&]	+		J	J$^{\pi}$: L(^{3}He,d)=1 from 7/2$^-$.
8374[e] *10*	3$^-$		G	J$^{\pi}$: L(p,p$'$)=3.
8390[b] *10*	+		J N	XREF: J(8371). J$^{\pi}$: L(^{3}He,d)=1 from 7/2$^-$.
8412[e] *10*	+		G J O	XREF: J(8400). J$^{\pi}$: L(^{3}He,d)=1 from 7/2$^-$.
8420[c]	6$^-$		N	XREF: Others: AG XREF: N(8450). J$^{\pi}$: L(α,t)=4, M6 excitation in (e,e$'$).
8451[&]	+		J	J$^{\pi}$: L(^{3}He,d)=1 from 7/2$^-$.
8457 *10*	3$^-$		G	J$^{\pi}$: L(p,p$'$)=3.
8505 *10*	3$^-$		G	J$^{\pi}$: L(p,p$'$)=3.
8569 *10*	0$^+$		G J S	XREF: J(8579)S(8580). J$^{\pi}$: L(p,p$'$)=0.
8600[b] *10*	3$^-$		N	B(E3)↑=0.0022 *3* (1964Be32) J$^{\pi}$: L(e,e$'$)=3.
8617 *10*			G J	XREF: J(8614). J$^{\pi}$: L(p,p$'$)=2,3,4. L(^{3}He,d)=1+3 from 7/2$^-$.
8679[e] *10*	3$^-$		G	J$^{\pi}$: L(p,p$'$)=3.
8710[‡h] *50*	+		E J N	XREF: J(8700)N(8690). J$^{\pi}$: L(^{3}He,n)=0+2. L(^{3}He,d)=1+3 from 7/2$^-$, D, E2 excitation in (e,e$'$).
8728 *10*	3$^-$		G	J$^{\pi}$: L(p,p$'$)=3.
8765.9[a] *5*	1	0.441[o] eV *37*	M	J$^{\pi}$: from excitation in (γ,γ').
8778 *10*	3$^-$		G	J$^{\pi}$: L(p,p$'$)=3.
8790 *10*	2		N	J$^{\pi}$: Q excitation in (e,e$'$).
8827 *10*			G	
8860 *10*	1$^+$,(2$^-$)		N	J$^{\pi}$: M1,(M2) excitation in (e,e$'$).
8890 *20*	1$^+$,(2$^-$)		N S	J$^{\pi}$: M1,(M2) excitation in (e,e$'$).
8940 *20*	(8$^-$,6$^-$)		N	J$^{\pi}$: (M8,M6) excitation in (e,e$'$).
8958.4[a] *5*	1	0.233[o] eV *36*	M	J$^{\pi}$: from excitation in (γ,γ').
9004[i] *9*	1$^+$	[o]	G N	XREF: G(9020). J$^{\pi}$: M1 excitation in (e,e$'$). L(p,p$'$)=0.
9050[&] *10*	1$^+$,(2$^-$)		N	J$^{\pi}$: M1,(M2) excitation in (e,e$'$).
9080 *20*	(8$^-$)		N	J$^{\pi}$: (M8) excitation in (e,e$'$).
9140.3[aq] *5*	1$^+$[j]	2.65[o] eV *15*	G MN	B(M1)=0.90 *5*.

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Adopted Levels, Gammas (continued)

^{52}Cr Levels (continued)

E(level)[†]	J^π	$T_{1/2}$[m]	XREF	Comments
				J^π: M1 excitation in (e,e′). L(p,p′)=0, 1^+ in (γ,γ′).
9200[@]	5^-			XREF: Others: AA J^π: L(α,^{2}He)=5.
9211.9[a] *5*	1^+	2.11[o] eV *14*	G MN	XREF: G(9221)N(9210). J^π: M1 excitation in (e,e′).
9245[e] *10*	1^+		G	J^π: L(p,p′)=0.
9327.0[a] *5*	1^+[k]	0.746[o] eV *80*	G N	J^π: M1 excitation in (e,e′).
9370 *20*	$1^+,2^-$		N	J^π: M1,M2 excitation in (e,e′).
9429.0[a] *5*	1^+	0.95[o] eV *11*	G MN	XREF: G(9440). J^π: M1 excitation in (e,e′).
9438.5[q] *9*	$12^{(+)}$		D N	J^π: from (HI,xnγ), γ to 10^+.
9450 *20*	8^-		N	XREF: Others: AG XREF: AG(9480). J^π: M8 excitation in (e,e′).
9470 *20*	$1^+,2^+$		N	J^π: M1, E2 excitation in (e,e′).
9580 *10*	0^+		E N	J^π: L(^{3}He,n)=0. But M1,(E1) excitation in (e,e′).
9612[i] *9*	1^+[k]		G N	XREF: G(9620). J^π: M1 excitation in (e,e′).
9660 *20*	8^-		N	XREF: Others: AG XREF: AG(9630). J^π: M8 excitation in (e,e′).
9724[i] *9*	1^+[k]		G MN	XREF: G(9740)M(9736)N(9720). J^π: M1 excitation in (e,e′).
9787[a] *3*	1^-[j]		M	J^π: π based on asymmetries for different g.s. dipole transition in (γ,γ′).
9830 *10*	1^+		N	J^π: M1 excitation in (e,e′).
9878[i] *9*	1^+[k]		E G N	XREF: E(9870)G(9870)N(9880). J^π: M1 excitation in (e,e′).
9910 *20*	8^-		N	J^π: M8 excitation in (e,e′).
9981[a] *3*	$(^-)$		M	J^π: π: based on asymmetrics for different g.s. dipole transition, see (γ,γ′),(pol γ,γ′).
10008[i] *9*	1^+[k]		G N	XREF: G(10000)N(10010).
10110 *20*	(8^-)		N	XREF: Others: AG XREF: AG(10130). J^π: (M8) excitation in (e,e′).
10130 *20*	$1,2^-$		NO	J^π: D,M2 excitation in (e,e′).
10161.3[q] *12*	(13^+)		D	J^π: from γ(θ) in (HI,xnγ), E2 γ to 11^+.
10180 *10*	2^-		N	J^π: M2 excitation in (e,e′).
10240 *20*	1		N	J^π: E1, (M1) excitation in (e,e′).
10270 *20*	$1,(2^-)$		N	J^π: D, (M2) excitation in (e,e′).
10300 *20*			N	J^π: M2, M3,E3 excitation in (e,e′).
10330 *20*	6^-		N	XREF: Others: AG XREF: AG(10280). J^π: M6 excitation in (e,e′).
10340 *20*	1		N	J^π: D excitation in (e,e′).
10380[i] *14*	1^+[k]		G N	
10433[a] *4*	1^+		MN	J^π: M1 excitation in (e,e′).
10464 *9*	1^+[k]		G N	XREF: G(10480)N(10460). J^π: M1 excitation in (e,e′).
10500 *20*	1		N	J^π: D excitation in (e,e′).
10510 *20*	$(^-)$		N	J^π: (M8, M6) excitation in (e,e′).
10604[i] *12*	1^+[k]		G N	XREF: G(10580)N(10610).
10710 *10*	1		N	J^π: D excitation in (e,e′).

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Adopted Levels, Gammas (continued)

^{52}Cr Levels (continued)

E(level)[†]	J^π	XREF	Comments
10760 *10*	$6^+,8^+$	N	XREF: Others: AA XREF: AA(10750). J^π: L(α,^{2}He)=6,8.
10790 *9*	1^+[k]	G N	J^π: M1 excitation in (e,e′).
10800 *20*	$(^-)$	N	J^π: (M8,M6) excitation in (e,e′).
10820 *10*	$1^+,(2^-)$	N	J^π: M1, (M2) excitation in (e,e′).
10927[a] *3*	$1^+,2^-$	MN	XREF: N(10920). J^π: M1, M2 excitation in (e,e′).
10970 *20*	0^+[k]	G	J^π: L(p,p′)=0.
11000 *20*	8^-	N	J^π: M8 excitation in (e,e′).
11070 *10*	1	N	J^π: D excitation in (e,e′).
11140 *10*	0^+[k]	G N	XREF: G(11120). J^π: L(p,p′)=0.
11160 *20*	$(1^+),2$	N	J^π: (M1), Q excitation in (e,e′).
11170 *20*	8^-	N	XREF: Others: AG J^π: M8 excitation in (e,e′). L(α,t)=4.
11229 *3*		I	
11256.5 *7*		e I	XREF: e(11280).
11264.9 *4*	$+$[l]	e I	XREF: Others: AA T=3 XREF: e(11280)AA(11260). IAS (^{52}V g.s.). Some authors identify 11256.5 state as g.s. IAS. However, from a comparison of relative M1 transition rates from 11264.9 state with Gamow-Teller β decay matrix elements for ^{52}V g.s. 1973Fa12 concluded that most of the IAS strength lies in the 11265 state. The 11256 state might still be a fragment of the g.s. IAS.
11270 *20*	8^-	NO	J^π: M8 excitation in (e,e′).
11274.6[d] *6*	$+$[l]	e I	T=3 XREF: e(11280). Identified as fragment of IAS (^{52}V 23 keV).
11291.1[d] *10*		I	XREF: Others: AD
11330 *20*	$(1^+),2^-$	N	J^π: (M1), M2 excitation in (e,e′).
11370 *20*	8^-	N	XREF: Others: AG XREF: AG(11350). J^π: M8 excitation in (e,e′). L(α,t)=4.
11400.0[d] *4*	4^+	I	T=3 Identified by 1974Ro44 as IAS (^{52}V 148 keV, 4^+). J^π: From γ(theta) in (p,γ).
11402[i] *9*	1^+	G N	XREF: G(11410)N(11400). J^π: M1 excitation in (e,e′). L(p,p′)=0.
11510 *10*	2^-	N	J^π: M2 excitation in (e,e′).
11550 *20*	8^-	N	J^π: M8 excitation in (e,e′).
11570 *20*	$(1^+),2$	N	J^π: (M1),Q excitation in (e,e′).
11610 *10*	2	N	J^π: Q excitation in (e,e′).
11656[d] *3*	$1^+,2^-$	I N	XREF: N(11650). J^π: M1, M2 excitation in (e,e′).
11660 *20*	8^-	N	XREF: Others: AG J^π: M8 excitation in (e,e′).
11691.8[d] *4*		I N	T=3 IAS (^{52}V 437 keV, 2^+).
11713[d] *3*		I	
11725[d] *3*		I	
11745[d] *3*		I	

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Adopted Levels, Gammas (continued)

^{52}Cr Levels (continued)

E(level)[†]	J^π	XREF	Comments
11765[a] *3*		M	
11770 *20*	8^-	N	XREF: Others: AG XREF: AG(11790). J^π: M8 excitation in (e,e′).
11780 *20*	$(1^+),2^-$	N	J^π: (M1),M2 excitation in (e,e′).
11837[a] *3*		M	
11880 *20*	8^-	N	J^π: M8 excitation in (e,e′).
11960 *20*	8^-	N	J^π: M8 excitation in (e,e′).
12034.8[d] *4*	$-$	I N	XREF: Others: AG XREF: AG(12050). J^π: L(α,t)=4 from $7/2^-$.
12041.8[d] *4*	4^+[l]	I	T=3 IAS (^{52}V 793 keV, 3^+).
12050	$-$		XREF: Others: AG J^π: L(α,t)=4.
12099.9 *4*	4^+[l]	I	T=3 IAS (^{52}V 846 keV, 4^+).
12130 *20*	$(8^-,6^-)$	N	J^π: (M8,M6) excitation in (e,e′).
12240 *20*	6^-	N	J^π: M6 excitation in (e,e′).
12260[@]	$6^+,8^+$		XREF: Others: AA J^π: L(α,^{2}He)=6,8.
12500[c]	$-$		XREF: Others: AG J^π: L(α,t)=4 from $7/2^-$.
12560 *20*	1^+[k]	G	XREF: Others: AG
12665[d] *6*	3^+	I	T=3 IAS (^{52}V 1419 keV, 3^+)?
12730 *20*	$-$	N	XREF: Others: AG XREF: AG(12700). J^π: L(α,t)=4 from $7/2^-$.
12734[d] *6*		I	T=3 IAS (^{52}V 1493 keV, 7^+)?
12794.8 *7*	4^+[l]	I	T=3 IAS (^{52}V 1559 keV, 4^+)?
12900 *20*	1^+[k]	G	
12977[d] *6*	$-$[l]	I	XREF: Others: AG T=3 XREF: AG(13010). J^π: L(α,t)=4 from $7/2^-$. IAS (^{52}V 1733 keV, $3^-,4^-$)?
12994[d] *6*	$+$[l]	I	IAS (^{52}V 1760 keV, 3^+)?
13038[d] *6*	$+$[l]	I	IAS (^{52}V 1843 keV, +)?
13220 *20*	8^-	N	J^π: M8 excitation in (e,e′).
13319[d]		I	
13393[d]	6^-	I N	J^π: M6 excitation in (e,e′).
13419[d]	0^+	E I	T=3 J^π: L(^{3}He,n)=0.
13570 *20*	6^-	N	J^π: M6 excitation in (e,e′).
13580[g] *20*	$(1,2)^-$		XREF: Others: AD J^π: L(^{3}He,α)=0 from $3/2^-$.
13630[‡] *10*	0^+	E	T=3 J^π: L(^{3}He,n)=0. IAS (^{52}V 2396 keV, 0^+, (1^+))?

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Adopted Levels, Gammas (continued)

^{52}Cr Levels (continued)

E(level)[†]	J^π	XREF	Comments
13710 *20*	6^-	N	J^π: M6 excitation in (e,e′).
13950[‡] *50*		E	
14030 *20*	6^-	N	J^π: M6 excitation in (e,e′).
14110[‡] *20*	2^+	E	T=3 J^π: L(^{3}He,n)=2. IAS (^{52}V 2881 keV, +)?
14340 *20*	6^-	N	J^π: M6 excitation in (e,e′).
14430 *20*	8^-	N	XREF: Others: AG XREF: AG(11470). J^π: M8 excitation in (e,e′).
15270 *20*	6^-	N	XREF: Others: AG XREF: AG(15280). J^π: M6 excitation in (e,e′). L(α,t)=4.
15482[c] *7*	8^-	N	XREF: Others: AG T=3 J^π: M8 excitation in (e,e′).
16400 *20*	6^-	N	J^π: M6 excitation in (e,e′).
16690 *20*	(8^-)	N	J^π: (M8) excitation in (e,e′).

[†] Levels connected by gammas are from least squares fit, others from ^{52}Cr(p,p′) for E(level)<8830 keV and from ^{52}Cr(e,e′) for E(level)>8830 keV, except as noted.
[‡] From ^{50}Ti(^{3}He,n).
[#] From ^{50}Cr(t,p).
[@] From ^{50}Cr(α,^{2}He).
[&] From ^{51}V(^{3}He,d).
[a] From ^{52}Cr(γ,γ'),(pol γ,γ').
[b] From ^{52}Cr(e,e′).
[c] From ^{51}V(α,t).
[d] From ^{51}V(p,γ).
[e] From ^{52}Cr(p,p′).
[f] From ^{52}Cr(α,α').
[g] From ^{53}Cr(^{3}He,α).
[h] Close doublet; not resolved in (^{3}He,n) tof spectra, but separated in angular distribution procedure.
[i] From weighted average of values in ^{52}Cr(e,e′) and ^{52}Cr(p,p′).
[j] Dipole transition in ^{52}Cr(γ,γ'),(pol γ,γ').
[k] Based on $\sigma(\theta)$, DWIA calculations in ^{52}Cr(p,p′).
[l] IAS in ^{51}V(p,γ) E=res.
[m] From (HI,xnγ), DSAM, except as noted.
[n] From (n,n′γ).
[o] Partial decay width into ground state in ^{52}Cr(γ,γ'),(pol γ,γ').
[p] Band(A): g.s. Band.
[q] Band(B): Band based on 5^+.

$\gamma(^{52}Cr)$

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[d]	δ[d]	Comments
1434.091	2^+	1434.068[b] 14	100	0.0	0^+	E2[@]		B(E2)(W.u.)=10.3 3
2369.630	4^+	935.538[b] 11	100	1434.091	2^+	E2[@]		B(E2)(W.u.)=1.0×10^{-11} +3−6
2646.9	0^+	1212.8 6	100	1434.091	2^+	E2		E_γ: from (p,p′γ).
2767.767	4^+	398.08[#] 9	1.76 14	2369.630	4^+	E2[@]		B(E2)(W.u.)=45 13 I_γ: other: 1.36 17 in ^{52}V β^- decay.
		1333.649 17	100 1	1434.091	2^+	E2[@]		B(E2)(W.u.)=6.0 16
2964.786	2^+	1530.67[‡] 1	100[‡] 4	1434.091	2^+	M1+E2	−6.25 15	B(M1)(W.u.)=0.00036 8; B(E2)(W.u.)=13 3
		2965[‡] 1	0.9[‡] 6	0.0	0^+	E2[#]		B(E2)(W.u.)=0.005 4
3113.858	6^+	346.02 4	1.09 1	2767.767	4^+	E2		B(E2)(W.u.)=2.58 10
		744.233 13	100.0 9	2369.630	4^+	E2		B(E2)(W.u.)=5.14 19
3161.74	2^+	1727.53[‡] 7	100[‡] 5	1434.091	2^+	M1+E2	−0.18 7	B(M1)(W.u.)=0.107 23; B(E2)(W.u.)=2.6 21
		3161.8[‡] 1	10.0[‡] 14	0.0	0^+	E2		B(E2)(W.u.)=0.40 10
3415.32	4^+	647.47 6	100 5	2767.767	4^+	M1+E2[@e]	0.22[@e] 8	B(M1)(W.u.)=0.24 7; B(E2)(W.u.)=6.E+1 5
		766.0[#f] 10		2646.9	0^+			The γ′s placement is highly suspect because ΔJ=4.
		1045.73[b] 4	17 5	2369.630	4^+			
		1981.12 4	8.5 8	1434.091	2^+	[E2]		B(E2)(W.u.)=0.42 13
3472.25	3^+	704.6[‡] 2	100	2767.767	4^+	M1+E2	−0.14 6	B(M1)(W.u.)=0.0059 7; B(E2)(W.u.)=0.5 5 I_γ: From (n,n′γ).
		2038.0[‡] 2	44.2 12	1434.091	2^+			I_γ: From (n,n′γ).
3615.924	5^+	200.58 4	1.80 5	3415.32	4^+			
		502.06 5	5.0 5	3113.858	6^+			
		848.18 5	78.9 7	2767.767	4^+	M1[@]		B(M1)(W.u.)=0.006 3
		1246.278 15	100.0 14	2369.630	4^+			
3771.72	2^+	2337.44[c] 19	100[‡] 14	1434.091	2^+	M1+E2	−0.20 8	B(M1)(W.u.)=0.15 5; B(E2)(W.u.)=2.4 20
		3771.7[‡] 2	26[‡] 6	0.0	0^+	[E2]		B(E2)(W.u.)=1.5 5
3947.5	2^+	1578[&]		2369.630	4^+			
3951.2	2^+	3951[‡] 1	[‡]	0.0	0^+			
4015.51	5^+	399.57 5	46.9 18	3615.924	5^+			I_γ: other: 33.3 5 in (HI,xnγ).
		600.16 5	100 3	3415.32	4^+	M1[@]		B(M1)(W.u.)=0.062 +20−28
		901.89 18	11.3 11	3113.858	6^+			
		1247.88 9	97 10	2767.767	4^+	M1[@]		B(M1)(W.u.)=0.0067 +23−31
		1645.82 4	12.1 8	2369.630	4^+			
4039.1	4^+	566.8[@]	100[@]	3472.25	3^+			
4563.0	3^-	791[&]		3771.72	2^+			
		3129[‡] 1		1434.091	2^+			
4584.0	(6^+)	1470.1[@] 7	100[@]	3113.858	6^+			
4627.32	4^+	2257.42 19	100	2369.630	4^+			

$^{52}_{24}Cr_{28}$-13

Adopted Levels, Gammas (continued)

$\gamma(^{52}Cr)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[d]	δ[d]	Comments
4750.31	8^+	1636.4[@] 2	100[@]	3113.858	6^+	E2[@]		B(E2)(W.u.)=5.E+1 +7−5
4805.96	6^+	790.0[@] 3	100[@] 8	4015.51	5^+	(M1+E2)[@e]	−0.16[@e] 5	B(M1)(W.u.)=(0.062 +19−37); B(E2)(W.u.)=(6 +4−5)
		1189.7[@]	20[@] 5	3615.924	5^+			
		1693.9[@] 6	23[@] 3	3113.858	6^+			
4815.69	$1^+,2^+$	3381.5[‡] 1	100[‡] 20	1434.091	2^+			
		4815.4[‡] 2	100[‡] 16	0.0	0^+			
5098.6	1	3664.5[a] 5	79[a] 22	1434.091	2^+			
		5098.3[a] 5	100[a]	0.0	0^+			
5213.7	1	5213.4[a] 5	100[a]	0.0	0^+			
5396.9	7^+	590.9[@] 3	100[@] 6	4805.96	6^+	M1+E2[@e]	−0.27[@e] 6	B(M1)(W.u.)=0.6 +4−6; B(E2)(W.u.)=2.9×10^2 +22−28
		1381.5[@] 5	15.2[@] 16	4015.51	5^+	E2[@]		B(E2)(W.u.)=9 +6−8
5526.0	1	5525.7 5		0.0	0^+			
5544.7	(1^+)	5544.4[a]	100[a]	0.0	0^+			
5633.4	(8^+)	1049.4[@] 8	100[@]	4584.0	(6^+)			
5824.7	8^+	427.9[@] 3	100[@]	5396.9	7^+	M1(+E2)[@e]	−0.03[@e] 4	α(K)=0.00166; α(L)=0.00016 B(M1)(W.u.)=(0.28 +12−17); B(E2)(W.u.)=(3 +9−3)
6137.0	2^+	6136.6[a]	100[a]	0.0	0^+			
6356.6	(9^+)	725.5[@f] 12	100[@]	5633.4	(8^+)			
6365.3	(10^+)	1615.0[@] 10	100[@]	4750.31	8^+			
6381.0	(6^+)	2765.0[@]	100	3615.924	5^+			
6389.9	1^+	6389.5[a] 5	100[a]	0.0	0^+			
6453.4	9^+	628.9[@] 5	35[@] 18	5824.7	8^+	M1+E2[@e]	+0.22[@e] +15−8	B(M1)(W.u.)=0.13 11; B(E2)(W.u.)=4.E+1 +6−4
		1056.0[@] 10	26[@] 2	5396.9	7^+			
		1702.9[@] 5	100[@] 5	4750.31	8^+	M1+E2[@e]	−0.04[@e] +7−3	B(M1)(W.u.)=0.020 +12−13; B(E2)(W.u.)=0.02 +9−2
6462.4	1	6462.0[a] 5	100[a]	0.0	0^+			
6495.5	1	6495.1[a] 5	100[a]	0.0	0^+			
6752.0	1^+	6751.5[a] 5	100[a]	0.0	0^+			
7014.5	1	5580.5[a] 5	24[a] 6	1434.091	2^+			
		7013.6[a] 5	100[a]	0.0	0^+			
7090.8	1^+	7090.3[a] 5	100[a]	0.0	0^+			
7166.2	+	7165.7[a] 5	100[a]	0.0	0^+			
7237.9	10^+	784.5[@] 5	100[@] 12	6453.4	9^+	M1+E2[@e]	−0.06[@e] +3−5	B(M1)(W.u.)=0.19 +10−18; B(E2)(W.u.)=2 +3−2
		883.7[@f] 10	28[@] 3	6356.6	(9^+)			
		1413.6[@f] 10	8[@] 4	5824.7	8^+	[E2]		B(E2)(W.u.)=2.9 +21−29
		1606.0[@f] 20	15[@] 4	5633.4	(8^+)	[E2]		B(E2)(W.u.)=2.9 +17−28
7368.8	1^+	7368.2[a] 5	100[a]	0.0	0^+			
7401.6	(12^+)	1036.3[@]	100	6365.3	(10^+)	(E2)[@]		

$^{52}_{24}Cr_{28}$-14

Adopted Levels, Gammas (continued)

$\gamma(^{52}Cr)$ (continued)

E_i(level)	J^{π}_i	E_γ[†]	I_γ[†]	E_f	J^{π}_f	Mult.[d]	δ[d]	Comments
7403.2	1	7402.6[a] 5	100[a]	0.0	0^+			
7524.1	1^+	7523.5[a] 5	100[a]	0.0	0^+			
7731.9	1^-	7731.3[a] 5	100[a]	0.0	0^+			
7865.1	1^+	7864.5[a] 5	100[a]	0.0	0^+			
7889.0	1	7888.4[a] 5	100[a]	0.0	0^+			
7897.4	1^-	7896.8[a] 5	100[a]	0.0	0^+			
8015.4	1	6580.9[a] 5	54[a] *16*	1434.091	2^+			
		8014.6[a] 5	100[a]	0.0	0^+			
8091.3	1	8090.6[a] 5	100[a]	0.0	0^+			
8179.3	1^+	6744.8[a] 5	326[a] *50*	1434.091	2^+			E_γ: if 8179.2 level energy is correct, then $E\gamma$ should be 6744.8, not 6740.8 as listed in table I of 2013Pa38.
		8178.5[a] 5	100[a]	0.0	0^+			
8216.4	11^+	978.5[@] 5	97[@] *9*	7237.9	10^+	M1+E2[@e]	+0.10[@e] *+5−8*	B(M1)(W.u.)=0.048 *+19−35*; B(E2)(W.u.)=1.1 *+12−11*
		1763.3[@] *10*	100[@] *11*	6453.4	9^+	E2[@]		B(E2)(W.u.)=6.1 *+25−44*
8765.9	1	8765.1[a] 5	100[a]	0.0	0^+			
8958.4	1	8957.6[a] 5	100[a]	0.0	0^+			
9140.3	1^+	9139.4[a] 5	100[a]	0.0	0^+			
9211.9	1^+	9211.0[a] 5	100[a]	0.0	0^+			
9327.0	1^+	9326.1[a] 5	100[a]	0.0	0^+			
9429.0	1^+	9428.1[a] 5	100[a]	0.0	0^+			
9438.5	$12^{(+)}$	1222.4[@] *8*	100[@] *5*	8216.4	11^+			
		2200.0[@] *10*	16.8[@] *11*	7237.9	10^+			
10161.3	(13^+)	721.3[@] *10*	4.7[@] *6*	9438.5	$12^{(+)}$			
		1943.6[@] *7*	100.0[@] *17*	8216.4	11^+	E2[@]		
11256.5		8291	100	2964.786	2^+			
		8488	85	2767.767	4^+			
11264.9	+	7648	<9	3615.924	5^+			
		7792	<5	3472.25	3^+			
		7850	39 *7*	3415.32	4^+	(M1+E2)[@e]	+0.06[@e] *9*	
		8150	25 *9*	3113.858	6^+			
		8299	<5	2964.786	2^+			
		8496	11 *7*	2767.767	4^+			
		8895	100 *16*	2369.630	4^+	(M1+E2)[@e]	+0.9[@e] *+10−5*	
		9830	34 *5*	1434.091	2^+	(M1+E2)[@e]	−0.30[@e] *6*	
11274.6	+	4479	72 *12*	6795.4	3^-			
		4899	24 *8*	6375.4				
		5069	36 *12*	6205.4				
		5239	20 *8*	6035.3				
		5549	100 *12*	5725.3	+			
		7258	60 *12*	4015.51	5^+			
		7326	24 *8*	3947.5	2^+			

From ENSDF

$^{52}_{24}Cr_{28}$-15

$\gamma(^{52}Cr)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.[d]	δ[d]	Comments
11274.6	+	7859	8 *4*	3415.32	4+	(M1+E2)[@e]	+0.47[@e] *10*	
		8904	56 *8*	2369.630	4+	(M1+E2)[@e]	+0.19[@e] *10*	
11291.1		9856	100	1434.091	2+			
11400.0	4+	5836	61 *5*	5563.5	+			
		5953	29 *5*	5446.4	4+			
		7360		4039.1	4+			
		7384		4015.51	5+			
		7783	26 *3*	3615.924	5+			
		7985	21 *3*	3415.32	4+			
		8285	5 *3*	3113.858	6+			
		9030	100 *5*	2369.630	4+	(M1+E2)[@e]	0.5[@e] *2*	δ: from (p,γ), see 1974Ro44.
11691.8		5302	33 *3*	6389.9	1+			
		6027	23 *3*	5664.4	(2)+			
		6245	53 *3*	5446.4	4+			
		6637	13 *7*	5054.3	4+			
		6854		4841.3	1+,1−,2+			
		6883		4805.96	6+			
		6949	37 *3*	4742.3	0+			
		7652		4039.1	4+			
		7676		4015.51	5+			
		8219	30 *7*	3472.25	3+			
		8277	7 *3*	3415.32	4+			
		8529	13 *3*	3161.74	2+			
		8726	27 *7*	2964.786	2+			
		8923	10 *3*	2767.767	4+			
		9322	27 *3*	2369.630	4+			
		10257	100 *7*	1434.091	2+			
12034.8	−	6471	22 *4*	5563.5	+			
		6588	22 *4*	5446.4	4+			
		7404	48 *4*	4627.32	4+			
		8562	17 *9*	3472.25	3+			
		8620	100 *9*	3415.32	4+			
		9069	17 *9*	2964.786	2+			
		9266	74 *4*	2767.767	4+			
		9665	78 *4*	2369.630	4+			
		10600	48 *4*	1434.091	2+			
12041.8	4+	6595	42 *4*	5446.4	4+			
		7233	19 *4*	4805.96	6+			
		8569	46 *4*	3472.25	3+			
		8627	19 *4*	3415.32	4+			
		8879	62 *4*	3161.74	2+			
		9076	7 *4*	2964.786	2+			
		9273	31 *4*	2767.767	4+			

$^{52}_{24}Cr_{28}$-16

Adopted Levels, Gammas (continued)

$\gamma(^{52}Cr)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f
12041.8	4^+	9672	100 *4*	2369.630	4^+
		10607	54 *4*	1434.091	2^+
12099.9	4^+	6239	39 *9*	5860.5	$^+$
		6362	39 *9*	5737.5	(4^+)
		6653	30 *9*	5446.4	4^+
		7002	13 *4*	5098.6	1
		7469	30 *4*	4611	$(3,4)^+$
		8060	30 *4*	4039.1	4^+
		8084	13 *2*	4015.51	5^+
12099.9	4^+	8152	22 *4*	3947.5	2^+
		8483	26 *4*	3615.924	5^+
		8627	17 *3*	3472.25	3^+
		8685	52 *9*	3415.32	4^+
		9331	35 *4*	2767.767	4^+
		9730	100 *9*	2369.630	4^+
12794.8	4^+	9178	81	3615.924	5^+
		10424	100	2369.630	4^+

† $E\gamma$<4 MeV from ^{52}Mn ε decay (5.591 d), $E\gamma$>4 MeV from ^{51}V(p,γ), except as noted.

‡ From ^{52}Mn ε decay (21.1 min).

From ^{52}V β^- decay.

@ From (HI,xnγ).

& From ^{51}V(^{3}He,dγ).

[a] From ^{52}Cr(γ,γ'),(pol γ,γ').

[b] From weighted average of values in ^{52}Mn ε decay (5.591 d) and ^{52}V β^- decay.

[c] From weighted average of values in ^{52}Mn ε decay (21.1 min) and ^{52}V β^- decay.

[d] From $\gamma\gamma(\theta)$ in ^{52}Cr(p,p$'\gamma$), except as noted.

[e] From ^{51}V(p,γ).

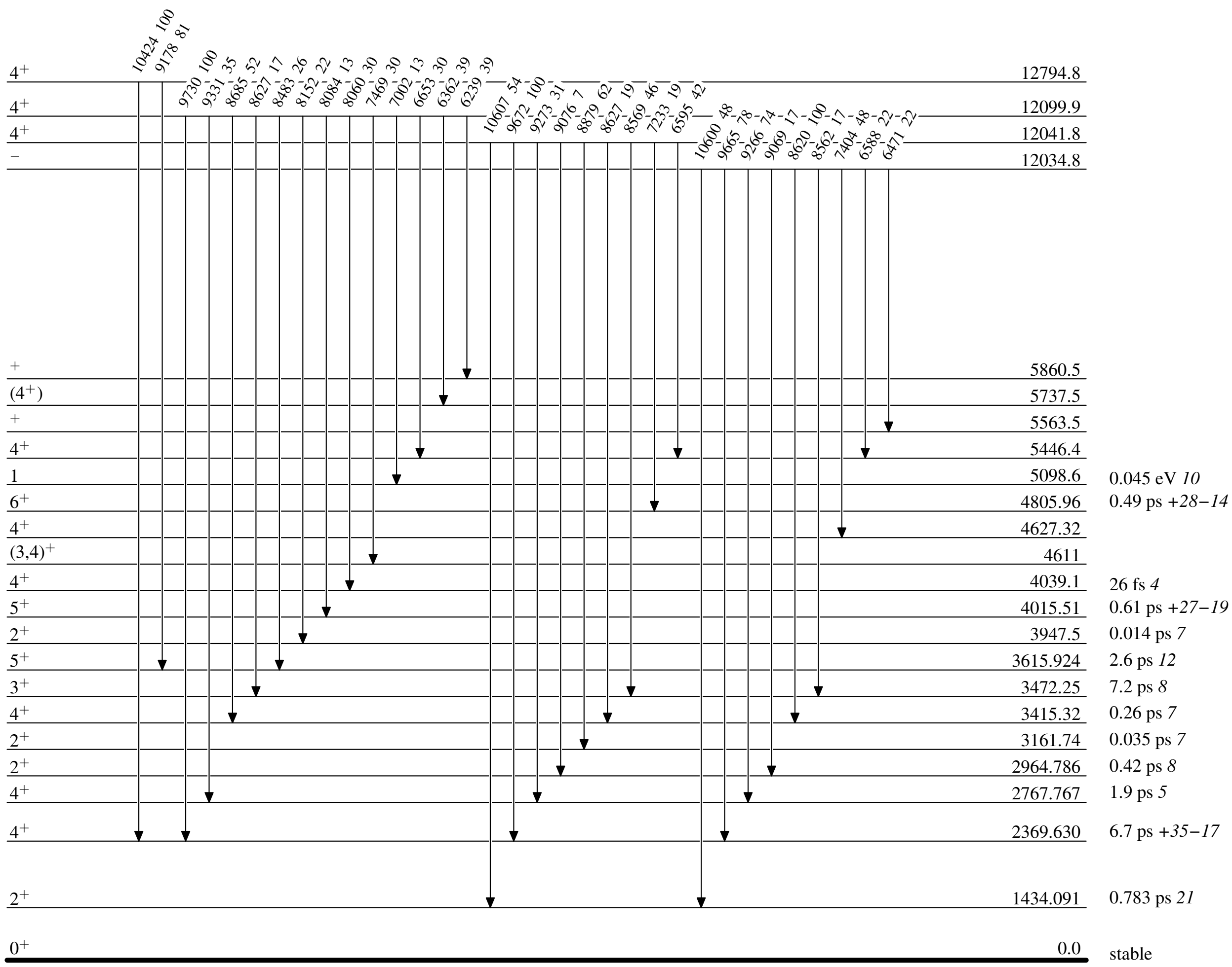
[f] Placement of transition in the level scheme is uncertain.

$^{52}_{24}Cr_{28}$-17

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

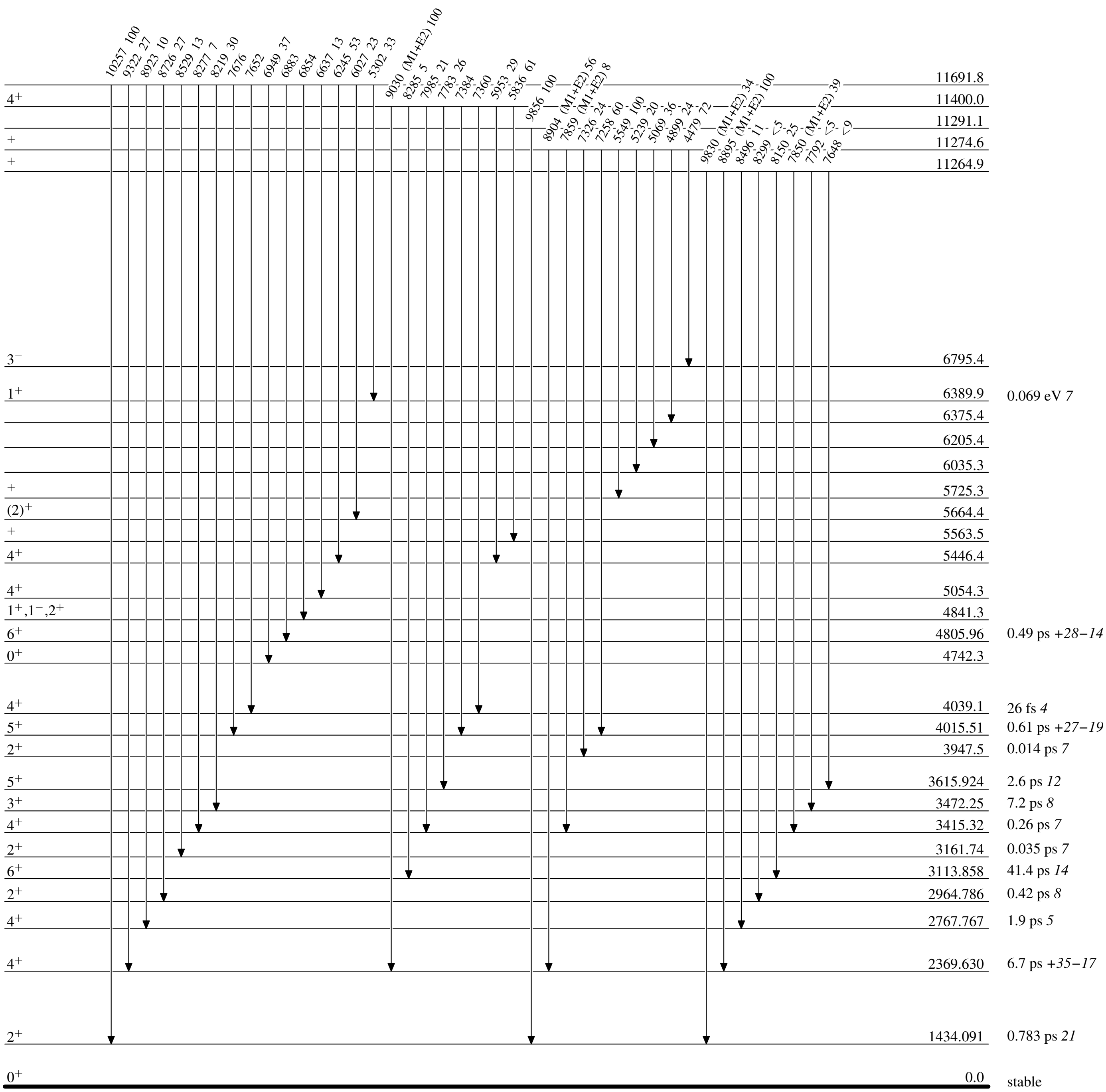


$^{52}_{24}Cr_{28}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{52}_{24}Cr_{28}$

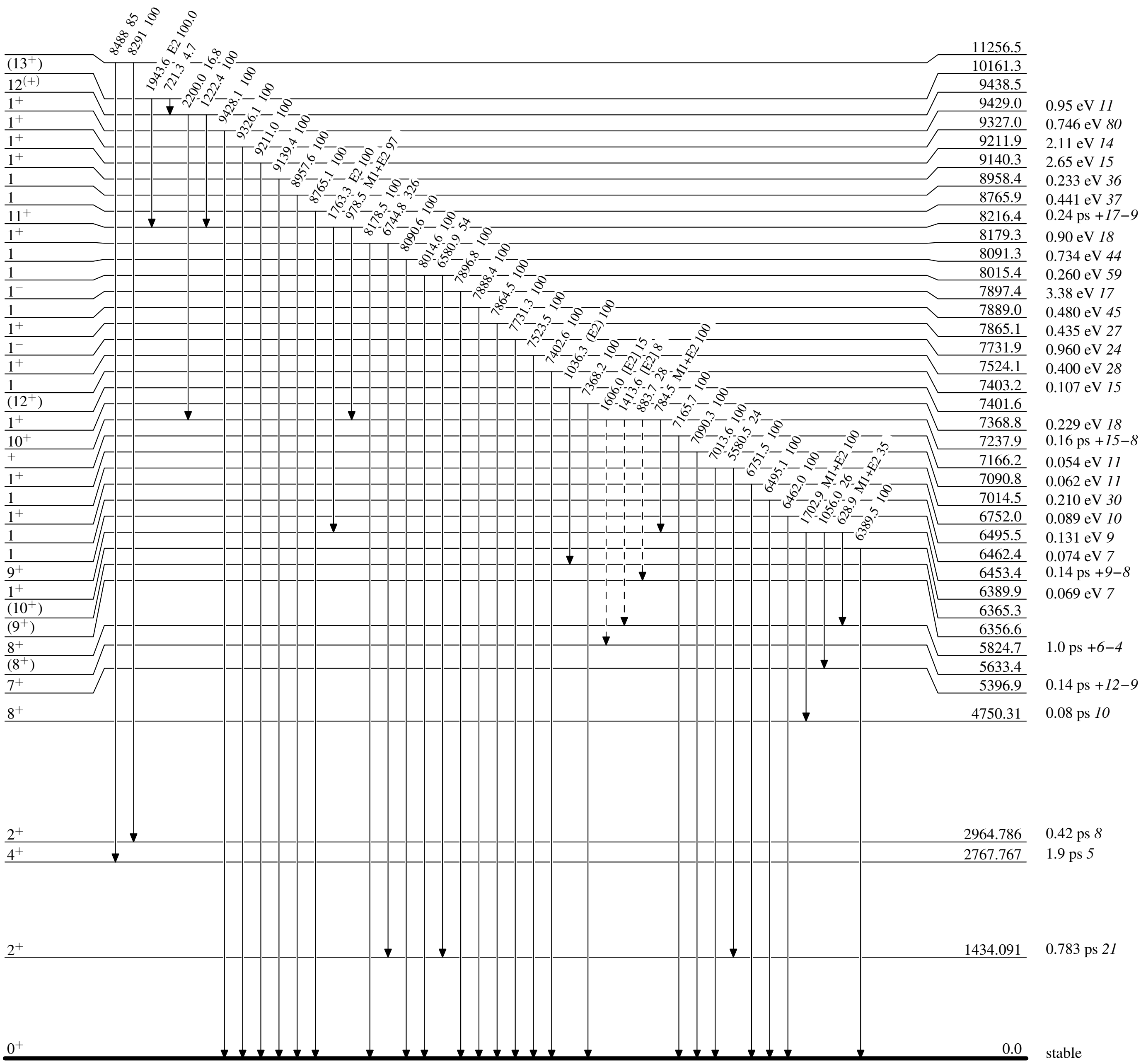
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{52}_{24}Cr_{28}$

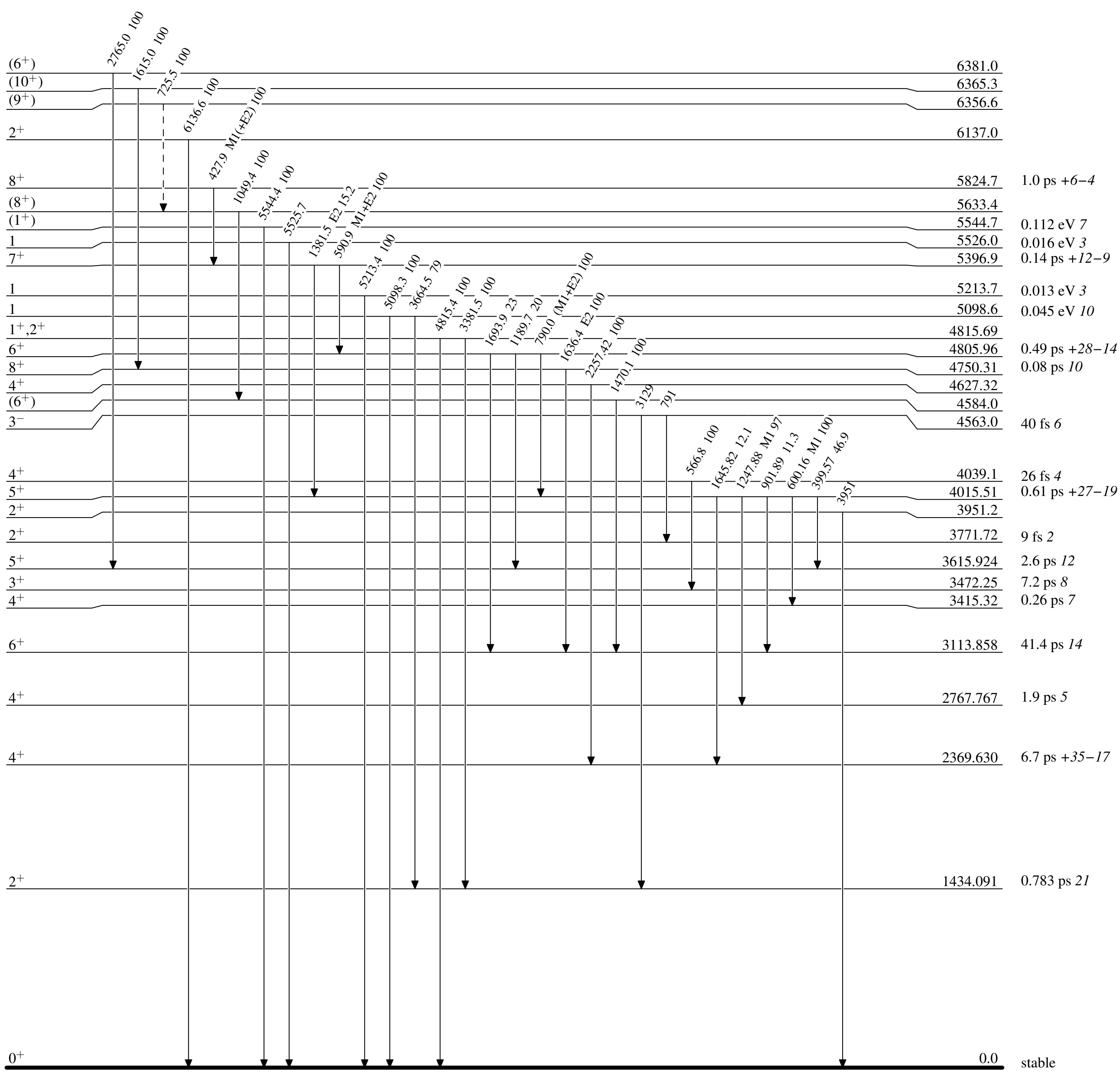
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{52}_{24}Cr_{28}$

Adopted Levels, Gammas

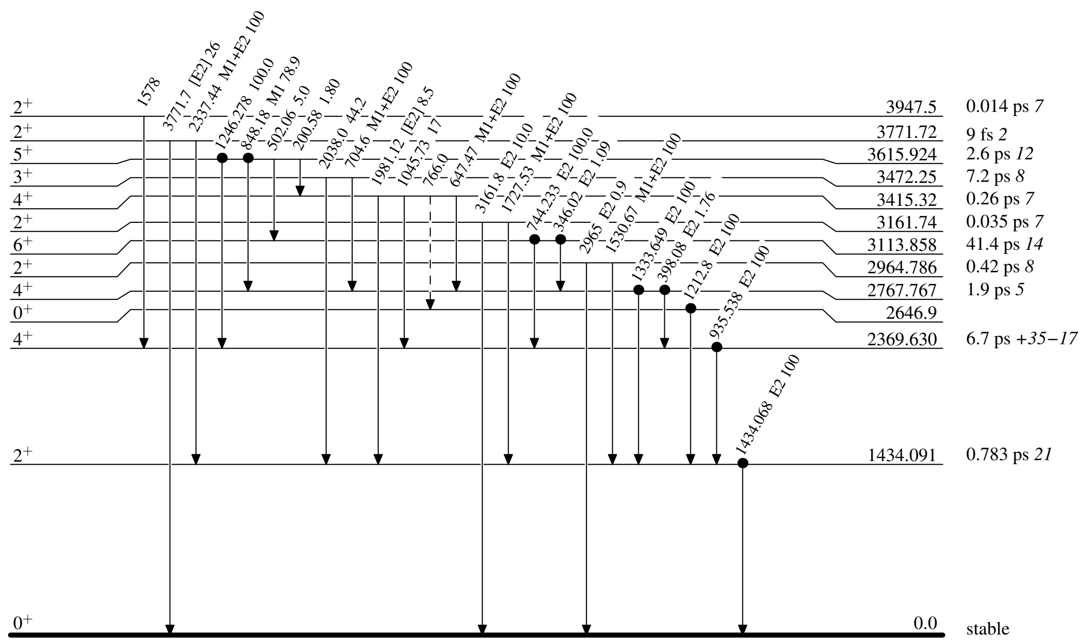
Level Scheme (continued)

Intensities: Relative photon branching from each level

Legend

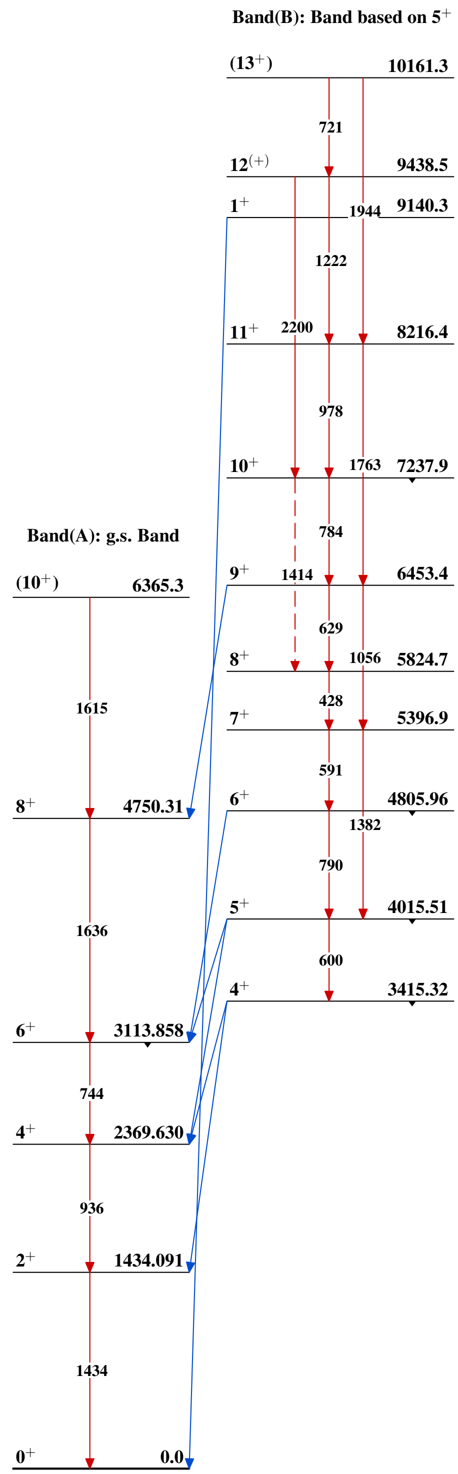
- - - - - -► γ Decay (Uncertain)

● Coincidence



$^{52}_{24}Cr_{28}$

Adopted Levels, Gammas



$^{52}_{24}Cr_{28}$