^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05

History

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

Others: 1988Di03, 1984Sz02, 1978ChZM, 1975Di10, 1974Ne12, 1967Er05, 1967Wa21.
1988Ca05: E=1.059, 1.072, 1.204, 1.451 and 1.513 MeV; measured Eγ, Iγ, $\gamma(\theta)$. Decay scheme given.
1986Di01: E=1.7-2.5 MeV (72 resonance states); measured Eγ, Iγ, $\gamma(\theta)$. Decay scheme given. 7 new bound levels determined.
1988Di03: E=2.5-3.1 MeV (75 resonance states); measured Eγ, Iγ, $\gamma(\theta)$.
1967Wa21: E=1.050-1.970 MeV; measured Eγ, Iγ. Decay scheme given.
1972Fo25: E=1-1.7 MeV; measured Eγ, Iγ, and σ(E(p); Eγ,θ); decay scheme given.
1974Ne12: E not given, measured $\gamma\gamma(\theta)$.
1975Di10: E=1.45-2.07 MeV; measured Eγ, Iγ, $\gamma(\theta)$. Decay scheme given.
1967Er05: E=1.600-1.830 MeV; measured $\gamma(\theta)$; deduced E(level) and J^π.
1978ChZM: E=1.451, 1.6 MeV, measured DSA.
Measured S(p)=5270.8 keV *3* (1972Fo25). Recommended value=5270.8 keV *3* (2017Wa10).

^{51}Mn Levels

Only resonances from which γ's have been observed are given. For other resonance states: at E(p)=1.7-2.5 MeV see 1986Di01; at E(p)=2.5-3.1 MeV see 1988Di03; at 3.08-3.36 MeV see 1984Sz02.

E(level)[†]	J^π[g]	$T_{1/2}$[h]	Comments
0.0	$5/2^-$		Deformation parameter is between 0.22 and 0.30 (1974Sc17).
237.3 *2*	$7/2^-$		
1139.8 *3*	$(9/2)^-$		
1488[b]	$11/2^-$[d]		E(level): also seen by 1984Sz02.
1817.1 *2*	$3/2^{(-)}$[a]		J^π: other: 5/2,(7/2) (1972Fo25).
1824.6 *1*	$3/2^-$	16 fs *4*	
1959.1 *6*	$1/2^-$		J^π: other: $(1/2^-)$,3/2 (1972Fo25).
2140.4 *2*	$3/2^-$	15 fs *4*	
2255.7 *1*	$(5/2^-)$		
2275.9 *2*	$1/2^+$		
2310.0 *5*	$5/2^-$[a]		
2415.9 *3*	$(7/2)^-$	4.2 fs *+28−21*	J^π: other: 7/2,(5/2) (1972Fo25).
2701.6[@] *5*	$3/2^-$[a]		
2841.4 *2*	$1/2^-$		J^π: from (^{3}He,d) L(p)=1, J^π=$1/2^-$ or $3/2^-$; for $\gamma(\theta)$ of S(p)+1059 to 2841-keV level there exists no solution for 3/2, but isotropic transitions of 2841 to 1825 and to 1959-keV levels are in good agreement with J^π=$1/2^-$ (1974Sc17).
2893.0[@] *4*	$5/2^-$[a]		
2913.5 *1*	$3/2^-$		
2983.5 *5*	$5/2^+$		
3029[a]	(7/2)[a]		
3048.6 *10*	$(3/2^-)$		
3058.1 *10*			
3091.5? *10*	$1/2^-$,$3/2^-$		
3130.5 *10*	$3/2^-$,$5/2^+$[a]		J^π: other: (7/2) (1972Fo25).
3281?[a]	(1/2,3/2)[a]		E(level): only seen at E(p)=1936 keV resonance state (1986Di01).
3292.3 *6*	$5/2^-$,$7/2^-$		
3423.3 *10*	$(3/2,5/2^-)$[a]		J^π: also measured by 1988Ca05.
3554.1 *5*	$3/2^-$		J^π: other: (3/2) (1986Di01).
3694.4 *5*	$3/2^-$[a]		
3730[&]	(7/2)[&]		
3826[a]	7/2[a]		

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^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

^{51}Mn Levels (continued)

E(level)[†]	J$^\pi$[g]	Comments
3835[a]	(7/2)[a]	
3877[a]	(3/2,5/2)[a]	
3893.2 *4*	1/2$^-$,3/2$^-$	J$^\pi$: J=3/2 from $\gamma(\theta)$ at E(p)=2043 keV resonance state, π=− from L=1 in ^{50}Cr(^{3}He,d).
3931.8?[‡] *3*	3/2,5/2$^-$	
3955[a]	(7/2,9/2)[a]	
4000?[&]		E(level): only seen at E(p)=2798 resonance state (1988Di03).
4005.9 *5*	(3/2$^-$,5/2$^-$)	
4046[a]		
4052?[#]		
4091.2? *10*	(5/2$^-$,7/2$^-$)	
4153[&]	(5/2$^+$)[a]	E(level): also seen by 1988Di03 and 1984Sz02.
4200[a]	(1/2,3/2)[a]	
4206.1 *10*	(5/2)	
4352.4 *10*	(3/2)[a]	
4451 *2*	7/2$^-$	IAS of ^{51}Cr(g.s.) (1988Ca05,1986Di01,1967Ra14).
4463?[&]		
4488.1 *7*	(5/2)[a]	
4532[c]		E(level): also seen by 1988Di03.
4540[a]	(3/2,5/2,7/2)	
4723	(1/2,3/2)[a]	J$^\pi$: other: (3/2$^+$,5/2$^+$) (1975Di10).
4739?[&]		
4776[c]		E(level): also seen by 1988Di03.
4883 *2*	1/2,3/2$^-$[a]	
4925		
5067[a]	(3/2)[a]	
5073	1/2$^-$,3/2$^-$	IAS of ^{51}Cr(777) (1988Ca05,1986Di01,1967Ra14).
5129	1/2$^-$,3/2$^-$	IAS of ^{51}Cr(749) (1988Ca05,1986Di01,1967Ra14).
5174	(1/2,3/2,5/2)[a]	
5188?		
5203?		
5212?		
5223		
5506?		E(level): from 1975Di10.
5585?		E(level): from 1975Di10.
S(p)+1059.1 *2*	3/2$^-$	Γ_γ=0.055 eV *17* (1974Sc17) E(level): IAS of 3/2$^-$ 1899 in ^{51}Cr.
S(p)+1070.8 *2*		E(level): E(p)=1072 (1988Ca05).
S(p)+1109.6 *5*		
S(p)+1123.3 *5*		
S(p)+1164.1 *5*		
S(p)+1203.6 *5*	5/2$^-$	E(level): E(p)=1204 (1988Ca05). Possible IAS of 5/2$^-$ 2002 (Coulomb energy difference ΔE=8440) in ^{51}Cr (1988Ca05).
S(p)+1219.6 *5*		
S(p)+1439.8 *10*		
S(p)+1451.3 *10*	5/2$^-$	E(level): E(p)=1451 (1988Ca05).
S(p)+1460.2 *10*		
S(p)+1481.0 *10*		
S(p)+1512.9 *10*	5/2$^-$	E(level): E(p)=1513 (1988Ca05).
S(p)+1545.0 *10*		
S(p)+1559.8 *10*		
S(p)+1563.0 *10*		
S(p)+1579.9 *10*		
S(p)+1600.3 *10*		

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^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

^{51}Mn Levels (continued)

E(level)[†]	J$^{\pi}$[g]	Comments
S(p)+1609.4 *10*		
S(p)+1678.1 *10*		
S(p)+1689.3 *10*		
S(p)+1798	3/2^{-}[f]	
S(p)+1810	1/2[f]	
S(p)+1830	3/2^{-}[f]	J$^{\pi}$: other: 3/2,5/2 (1967Er05).
S(p)+1872	5/2,7/2^{-}[f]	IAS of ^{51}Cr(2699) (1988Ca05,1986Di01).
S(p)+1895	1/2[f]	
S(p)+1908	5/2^{-}[f]	
S(p)+1913	3/2^{-}[f]	
S(p)+1929	1/2^{-}[f]	
S(p)+1936	1/2^{-}[f]	
S(p)+1937	5/2^{-}[f]	E(level): also seen by 1967Er05. From 6933$\gamma(\theta)$ to 7/2^{-} and fit to χ^2=0.1 (1967Er05).
S(p)+1942	5/2[f]	
S(p)+1943	5/2^{+}[f]	
S(p)+1958	3/2^{-}[f]	
S(p)+1978	(5/2)[f]	
S(p)+1981	(1/2,3/2)[f]	
S(p)+1990		
S(p)+2009	5/2$^{(+)}$[f]	
S(p)+2030	5/2^{-}[f]	
S(p)+2031[@] *3*	3/2^{-}	
S(p)+2042	5/2[f]	E(level): also seen by 1972Fo25.
S(p)+2043	3/2^{-}[f]	E(level): also seen by 1967Er05.
S(p)+2066	3/2^{-}[f]	E(level): also seen by 1972Fo25.
S(p)+2080	5/2^{+}[f]	
S(p)+2084		
S(p)+2110		
S(p)+2113	3/2^{+}[f]	
S(p)+2114	3/2^{-},5/2^{-}[f]	E(level): also seen by 1967Er05.
S(p)+2128	5/2^{-}[f]	
S(p)+2141	3/2^{+},5/2^{-}[f]	
S(p)+2142	3/2^{-}[f]	
S(p)+2167	3/2^{-},5/2^{-}[f]	
S(p)+2187	5/2^{+}[f]	
S(p)+2187	3/2^{-}	E(level),J$^{\pi}$: from 1967Er05. Primary $\gamma(\theta)'$s to lower levels with known J^{π} measured also by 1967Er05 and 1986Di01.
S(p)+2220	3/2^{-}[f]	
S(p)+2223	3/2^{-}[f]	
S(p)+2232	5/2[f]	
S(p)+2236		
S(p)+2240	1/2^{-}[f]	
S(p)+2275	5/2^{+}[f]	$\gamma(\theta)$ measured also in ^{50}Cr(p,p$'\gamma$) (1986Di01).
S(p)+2288	5/2^{-}[f]	
S(p)+2303	3/2^{-},5/2^{-}[f]	
S(p)+2321	5/2[f]	

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^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

^{51}Mn Levels (continued)

E(level)[†]	Jπ[g]	Comments
S(p)+2325	1/2$^-$[f]	
S(p)+2335	3/2$^-$,5/2$^-$[f]	
S(p)+2347		
S(p)+2362		
S(p)+2375		
S(p)+2394	1/2[f]	
S(p)+2397	7/2$^+$[f]	Also seen by 1985Di09 and 1987DiZX for γ transitions.
S(p)+2407	5/2$^-$[f]	
S(p)+2412		
S(p)+2420		
S(p)+2446		
S(p)+2461		
S(p)+2477	5/2$^+$[f]	
S(p)+2493	3/2$^-$[e]	
S(p)+2496		
S(p)+2507	3/2$^-$[f]	E(level): same as E(p)=2500 (1986Di01).
S(p)+2521	1/2[e]	
S(p)+2566	5/2$^-$[e]	
S(p)+2571	5/2[e]	
S(p)+2625		
S(p)+2630	3/2$^-$[e]	
S(p)+2669	[e]	
S(p)+2676		
S(p)+2696		
S(p)+2715	3/2$^-$,5/2$^-$,7/2[e]	
S(p)+2726	3/2$^-$[e]	
S(p)+2751		
S(p)+2798	9/2[e]	Also seen by 1987DiZX for γ transitions.
S(p)+2807		
S(p)+2830	3/2$^-$[e]	
S(p)+2849	3/2[e]	
S(p)+2887		
S(p)+2930	7/2$^-$[e]	
S(p)+2934	3/2$^-$,5/2$^-$,7/2[e]	
S(p)+2956	3/2$^-$,5/2[e]	
S(p)+2962	3/2,5/2$^-$[e]	
S(p)+2974		
S(p)+2987		
S(p)+3004	3/2$^-$,5/2$^-$[e]	
S(p)+3045		
S(p)+3049	5/2,7/2$^-$,9/2[e]	
S(p)+3055		
S(p)+3058	5/2$^-$[e]	
S(p)+3097		
S(p)+3172.3		E(level): may correspond to E(p)=3175 keV (1988Di03,1987DiZX).
S(p)+3192.2		
S(p)+3246.1		
S(p)+3258.6		E(level): may correspond to E(p)=3255 keV (1988Di03,1987DiZX).
S(p)+3266.2		
S(p)+3292.5		
S(p)+3350.6		
S(p)+3351.2		

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^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

^{51}Mn Levels (continued)

† For bound states, E(level) are from 1972Fo25 and 1974Sc17, except as noted. For unbound states, E(level) given as S(p)+E(p)(lab), where S(p)=5270.8 keV *3* (2012Wa38), E(p)(c.m.)=E(p)(lab)(50/51), E(p) is incident proton energy in lab system, and values of E(p) are taken as follows: 1059-1798 from 1972Fo25, 1798-2477, 2500 from 1986Di01, 2493-3149 from 1988Di03, 3170-3351 from 1984Sz02, except as noted. Only levels with γ information are given.
‡ From 1974Sc17.
# From 1975Di10.
@ From 1972Fo25.
& From 1988Di03. E(level) from primary γ transitions. J^π from $\gamma(\theta)$ from $9/2^+$ resonance state.
[a] From 1986Di01. E(level) from primary γ transitions. J^π from $\gamma(\theta)$ from resonance state with known J^π and fit to χ^2 vs (tan δ)$^{-1}$. Transitions with D+Q and large δ are taken as $\Delta\pi$=no.
[b] From primary γ transition from 9/2 resonance state (1985Di09).
[c] From primary γ transitions (1984Sz02).
[d] J^π from $\gamma(\theta)$ from g9/2 IAS (1984Sz02).
[e] J from $\gamma(\theta)$ and π from D,E2 to low states with known J^π (1988Di03).
[f] From $\gamma(\theta)$ to low states with known J^π (1986Di01).
[g] From Adopted Levels, except as noted.
[h] From DSA measurement (1978ChZM). These are preliminary values.

γ(^{51}Mn)

For Eγ, Iγ, $\gamma(\theta)$ and multipolarities of primary γ ray for E(p)=1.7-2.5 MeV (72 resonance states) (1986Di01), and E(p)=2.5-3.1 MeV (75 resonance states) (1988Di03); see 1986Di01 and 1988Di03.
For Eγ, Iγ of primary γ ray for g9/2 isobaric analog resonance states (E(p)=3.08-3.36 MeV); see 1984Sz02.
For the bound states, all data are from 1972Fo25, except as noted.
For the unbound states (E(level)=S(p)+E(p)(lab), where S(p)=5270.8 keV 3 (2017Wa10), E(p)(c.m.)=E(p)(lab)(50/51), E(p)(Lab) is incident proton energy in lab system), the data are from following sources: E(p)=1059-1798 from 1972Fo25, 1798-2500 from 1986Di01, 2500-3148 from 1988Di03, 3170-3351 from 1984Sz02, except as noted. For states whose transition γ energies were not given, Eγ deduced by evaluator according to decay scheme.

E$_i$(level)	J$_i^\pi$	E$_\gamma$	I$_\gamma$[†]	E$_f$	J$_f^\pi$	Mult.[e]	δ	Comments
237.3	$7/2^-$	238	100	0.0	$5/2^-$	D+Q	+0.16 *5*	δ: from 1974Ne12.
1139.8	$(9/2)^-$	902	89 *2*	237.3	$7/2^-$	D+Q		δ: −5.7 *21* or −0.36 *7* (1972Fo25). $\gamma(\theta)$: A_2=+0.19 *6*, A_4=0 (1972Fo25).
		1140	11 *2*	0.0	$5/2^-$			
1488	$11/2^-$	348[‡]		1139.8	$(9/2)^-$			
		1251[‡]		237.3	$7/2^-$			
		1488[‡]		0.0	$5/2^-$			
1817.1	$3/2^{(-)}$	1580[‡]		237.3	$7/2^-$			
		1817		0.0	$5/2^-$			$\gamma(\theta)$: A_2=−0.12 *7*, A_4=+0.16 *8* (1972Fo25).
1824.6	$3/2^-$	1825	100	0.0	$5/2^-$			$\gamma(\theta)$: A_2=−0.02 *3*, A_4=−0.03 *3* (1972Fo25).
1959.1	$1/2^-$	1959	100[#‡]	0.0	$5/2^-$	E2+M3		δ: +0.41 *14* or +1.4 *4* (1972Fo25). $\gamma(\theta)$: A_2=−0.09 *3*, A_4=0 (1972Fo25); A_2=+0.004 *8*, A_4=−0.005 *9* (1974Sc17).
2140.4	$3/2^-$	2140	100[#‡]	0.0	$5/2^-$	D+Q		δ: +0.26 *2* or +2.0 *9* (1972Fo25). $\gamma(\theta)$: A_2=+0.03 *3*, A_4=0 (1972Fo25).
2255.7	$(5/2^-)$	2018	69 *3*	237.3	$7/2^-$	D+Q		δ: +0.20 *7* or +2.8 *6* (1972Fo25). $\gamma(\theta)$: A_2=+0.08 *6*, A_4=+0.07 *7* (1972Fo25).
		2256	31 *3*	0.0	$5/2^-$			$\gamma(\theta)$: A_2=−0.33 *3* (1974Sc17).
2275.9	$1/2^+$	136[‡]	14[‡]	2140.4	$3/2^-$			

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^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[e]	Comments
2275.9	$1/2^+$	317‡	12‡	1959.1	$1/2^-$		
		451‡	11‡	1824.6	$3/2^-$		
		459‡	61‡	1817.1	$3/2^{(-)}$		
		2276‡	2‡	0.0	$5/2^-$		
2310.0	$5/2^-$	493‡	10‡	1817.1	$3/2^{(-)}$		
		2073‡	79‡	237.3	$7/2^-$		
		2310‡	11‡	0.0	$5/2^-$		
2415.9	$(7/2)^-$	277[b]	8[b]	2140.4	$3/2^-$		
		599[b]	15[b]	1817.1	$3/2^{(-)}$		
		1276[b]	37[b]	1139.8	$(9/2)^-$	D+Q	δ: −0.02 *10* or +1.8 *55* (1972Fo25). $\gamma(\theta)$: A_2=−0.24 *7*, A_4=+0.12 *8* (1972Fo25).
		2178[b]	34[b]	237.3	$7/2^-$	D+Q	δ: −0.4 *87* from 1972Fo25. $\gamma(\theta)$: A_2=+0.13 *11*, A_4=−0.11 *12* (1972Fo25).
		2416[b]	6[b]	0.0	$5/2^-$		
2701.6	$3/2^-$	392‡	38‡	2310.0	$5/2^-$		
		426‡	4‡	2275.9	$1/2^+$		
		562‡	4‡	2140.4	$3/2^-$		
		743‡	28‡	1959.1	$1/2^-$		
		877‡	7‡	1824.6	$3/2^-$		
		885‡	19‡	1817.1	$3/2^{(-)}$		
		1562[gbi]		1139.8	$(9/2)^-$		I_γ: 1975Di10 report Iγ=2%.
2841.4	$1/2^-$	882[a]	71.6[a]	1959.1	$1/2^-$		
		1017[a]	24.2[a]	1824.6	$3/2^-$		
		1024[a]	4.2[a]	1817.1	$3/2^{(-)}$		
2893.0	$5/2^-$	1068‡	3‡	1824.6	$3/2^-$		
		1076‡	20‡	1817.1	$3/2^{(-)}$		
		1753‡	35‡	1139.8	$(9/2)^-$		
		2656‡	6‡	237.3	$7/2^-$		
		2893‡	36‡	0.0	$5/2^-$		
2913.5	$3/2^-$	2914	100	0.0	$5/2^-$	D+Q	δ: +0.13 *15* or +1.8 *6* (1972Fo25). $\gamma(\theta)$: A_2=−0.13 *7*, A_4=0 (1972Fo25).
2983.5	$5/2^+$	2747	70 *5*	237.3	$7/2^-$		
		2984	30 *5*	0.0	$5/2^-$		
3029	(7/2)	2792‡	63‡	237.3	$7/2^-$		
		3029‡	37‡	0.0	$5/2^-$		
3048.6	$(3/2^-)$	773[b]	@&	2275.9	$1/2^+$		
		793[b]	@&	2255.7	$(5/2^-)$		
		1232‡	26@&‡	1817.1	$3/2^{(-)}$		
		1909‡	28@&‡	1139.8	$(9/2)^-$		
		2812‡	46@&‡	237.3	$7/2^-$		
3058.1		3058	100	0.0	$5/2^-$		
3130.5	$3/2^-,5/2^+$	821‡	10‡	2310.0	$5/2^-$		
		855[i]		2275.9	$1/2^+$		I_γ: 1972Fo25 report Iγ=4%.
		875[bi]		2255.7	$(5/2^-)$		I_γ: 1972Fo25 report Iγ/Iγ(1314γ)=12/45.
		991‡	19‡	2140.4	$3/2^-$		
		1305‡	15‡	1824.6	$3/2^-$		
		1314‡	56‡	1817.1	$3/2^{(-)}$		

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^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Comments
3292.3	5/2$^-$,7/2$^-$	1037[‡]	10[‡]	2255.7	(5/2$^-$)	
		1153[‡]	3[‡]	2140.4	3/2$^-$	
		3056[‡]	60[‡]	237.3	7/2$^-$	
		3293[‡]	27[‡]	0.0	5/2$^-$	
3423.3	(3/2,5/2$^-$)	1464[i]	25 *4*	1959.1	1/2$^-$	
		3423	75 *4*	0.0	5/2$^-$	
3554.1	3/2$^-$	3553	100	0.0	5/2$^-$	
3694.4	3/2$^-$	780[i]	10 *2*	2913.5	3/2$^-$	I_γ: not seen by 1986Di01.
		1554	25 *4*	2140.4	3/2$^-$	
		1869	50 *6*	1824.6	3/2$^-$	
		3694	15 *3*	0.0	5/2$^-$	
3826	7/2	2685[‡]	29[‡]	1139.8	(9/2)$^-$	
		3589[‡]	12[‡]	237.3	7/2$^-$	
		3825[‡]	59[‡]	0.0	5/2$^-$	
3835	(7/2)	1578[‡]	45[‡]	2255.7	(5/2$^-$)	
		2694[‡]	25[‡]	1139.8	(9/2)$^-$	I_γ: 30% unknown for this level (1986Di01).
3877	(3/2,5/2)	1918[‡]	50[‡]	1959.1	1/2$^-$	I_γ: 50% unknown for this level (1986Di01).
3893.2	1/2$^-$,3/2$^-$	1052[i]		2841.4	1/2$^-$	I_γ: not seen by 1986Di01.
		3893[‡]	100	0.0	5/2$^-$	
3931.8?	3/2,5/2$^-$	1791.4[ai]	100[a]	2140.4	3/2$^-$	$\gamma(\theta)$: A_2=−0.46 *6*, A_4=0 (1974Sc17).
3955	(7/2,9/2)	2815[‡]	28[‡]	1139.8	(9/2)$^-$	I_γ: 72% unknown for this level (1986Di01).
4005.9	(3/2$^-$,5/2$^-$)	1730[‡]	32[‡]	2275.9	1/2$^+$	
		3769[‡]	68[‡]	237.3	7/2$^-$	
4046		4046[‡]	100[‡]	0.0	5/2$^-$	
4052?		1067[bi]	100[b]	2983.5	5/2$^+$	
4091.2?	(5/2$^-$,7/2$^-$)	1951[i]	93 *7*	2140.4	3/2$^-$	I_γ: 7% unknown for this level (1972Fo25).
4153	(5/2$^+$)	2013[‡]	33[‡]	2140.4	3/2$^-$	
		2328[‡]	67[‡]	1824.6	3/2$^-$	
4200	(1/2,3/2)	1924[‡]	40[‡]	2275.9	1/2$^+$	
		2383[‡]	60[‡]	1817.1	3/2$^{(-)}$	
4206.1	(5/2)	2380[‡]	15[‡]	1824.6	3/2$^-$	
		2388[‡]	15[‡]	1817.1	3/2$^{(-)}$	
		3968[‡]	43[‡]	237.3	7/2$^-$	
		4205[‡]	27[‡]	0.0	5/2$^-$	
4352.4	(3/2)	803[bi]	15[b]	3554.1	3/2$^-$	I_γ: not seen by 1986Di01 or by 1972Fo25.
		2399[bi]	25[b]	1959.1	1/2$^-$	I_γ: not seen by 1986Di01 or by 1972Fo25.
		4358[‡]	45[b]	0.0	5/2$^-$	
4451	7/2$^-$	1319[‡]	30[‡]	3130.5	3/2$^-$,5/2$^+$	
		2141[bi]		2310.0	5/2$^-$	
		2194[‡]	34[‡]	2255.7	(5/2$^-$)	
		2491[bi]		1959.1	1/2$^-$	
		2625[b]		1824.6	3/2$^-$	
		2633[‡]	36[‡]	1817.1	3/2$^{(-)}$	
4488.1	(5/2)	2232[‡]	37[‡]	2255.7	(5/2$^-$)	
		4251[‡]	63[‡]	237.3	7/2$^-$	
4540	(3/2,5/2,7/2)	1838[‡]	50[‡]	2701.6	3/2$^-$	
		2581[‡]	50[‡]	1959.1	1/2$^-$	

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ [†]	E_f	J_f^π	Mult.[e]	Comments
4540	(3/2,5/2,7/2)	3400[i]		1139.8	$(9/2)^-$		
4723	(1/2,3/2)	2021[‡]	100[‡]	2701.6	$3/2^-$		Not seen by 1986Di06, but 1972Fo25 report Iγ=100%.
		4723[bi]		0.0	$5/2^-$		I_γ: 85 (1975Di10). Not seen by 1986Di10. The 2021γ is not seen by 1972Fo25.
4883	$1/2,3/2^-$	2042		2841.4	$1/2^-$		I_γ: 15 *8* (1972Fo25), 60 (1975Di10). Not seen by 1986Di01.
		2743[‡]	50[‡]	2140.4	$3/2^-$		
		2924[‡]	50[‡]	1959.1	$1/2^-$		
4925		1938[bi]		2983.5	$5/2^+$		I_γ: 25 (1975Di10).
		2011[bi]		2913.5	$3/2^-$		I_γ: 75 (1975Di10).
		2613[‡]	55[‡]	2310.0	$5/2^-$		I_γ: 45% unknown for this level (1986Di01).
5073	$1/2^-,3/2^-$	2798[bi]		2275.9	$1/2^+$		I_γ: 50 (1975Di10). Not seen by 1986Di01.
		2818[‡]	60[‡]	2255.7	$(5/2^-)$		
		3115[‡]	40[‡]	1959.1	$1/2^-$		I_γ: other: 35 (1975Di10).
		3257[bi]		1817.1	$3/2^{(-)}$		I_γ: 15 (1975Di10). Not seen by 1986Di01.
5129	$1/2^-,3/2^-$	2144[bi]		2983.5	$5/2^+$		I_γ: 25 (1975Di10). Not seen by 1986Di01.
		2819[‡]	22[‡]	2310.0	$5/2^-$		
		2873[‡]	40[‡]	2255.7	$(5/2^-)$		
		3304[‡]	15[‡]	1824.6	$3/2^-$		
		3312[‡]	23[‡]	1817.1	$3/2^{(-)}$		
5174	(1/2,3/2,5/2)	3216[‡]	52[‡]	1959.1	$1/2^-$		
		3350[‡]	48[‡]	1824.6	$3/2^-$		
5188?		2137[bi]	28[b]	3048.6	$(3/2^-)$		
		2274[bi]	20[b]	2913.5	$3/2^-$		
		2296[bi]	18[b]	2893.0	$5/2^-$		
		4950[bi]	34[b]	237.3	$7/2^-$		
5203?		5203[bi]	70[b]	0.0	$5/2^-$		
5212?		2298[i]	25 *8*	2913.5	$3/2^-$		
		4974[hi]	40[h] *8*	237.3	$7/2^-$		
5223		3406[bi]	30[b]	1817.1	$3/2^{(-)}$		
		4985[bi]	50[b]	237.3	$7/2^-$		
		5223[i]		0.0	$5/2^-$		
5506?		1454[bi]	65[b]	4052?			
		5268[bi]	35[b]	237.3	$7/2^-$		
5585?		5585[i]	100	0.0	$5/2^-$		
S(p)+1059.1	$3/2^-$	2303[i]	1			(M1)[f]	Γγ=0.0006 eV (1974Sc17) B(M1)(W.u.)=0.0023 (1974Sc17)
		2377[i]	1.4			M1+E2	Γγ=0.0008 eV (1974Sc17) B(M1)(W.u.)=0.0028 (1974Sc17) δ: −0.05 *3* or +4.9 *10* (1974Sc17). γ(θ): A_2=+0.32 *4*, A_4=−0.03 *4* (1974Sc17).
		2415	0.7			(M1)[f]	Γγ=0.0004 eV (1974Sc17) B(M1)(W.u.)=0.0014 (1974Sc17)
		2754	0.8			(M1)[f]	Iγ=1 (1988Ca05) Γγ=0.0004 eV (1974Sc17) B(M1)(W.u.)=0.0009 (1974Sc17)
		3323	4	3029	(7/2)		Γγ=0.0022 eV (1974Sc17)
		3394	6.1			M1+E2	Iγ=5 (1988Ca05)

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

γ(^{51}Mn) (continued)

E_i(level)	E_γ	I_γ[†]	E_f	J^π_f	Mult.[e]	Comments
						Γ_γ=0.0034 eV (1974Sc17) B(M1)(W.u.)=0.0041 (1974Sc17) δ: −0.06 *3* or +5.0 *12* (1974Sc17). $\gamma(\theta)$: A_2=+0.31 *4*, A_4=+0.02 *4* (1974Sc17).
S(p)+1059.1	3467	12.8			M1+E2	Iγ=13 (1988Ca05) Γ_γ=0.0071 eV (1974Sc17) B(M1)(W.u.)=0.0081 (1974Sc17) δ: −0.09 *2* or −1.4 *1* (1974Sc17). $\gamma(\theta)$: A_2=−0.64 *2*, A_4=−0.01 *2* (1974Sc17).
	4032	1.2			E1+M2[f]	Iγ=1 (1988Ca05) Γ_γ=0.0007 eV (1974Sc17) B(E1)(W.u.)=0.00001 (1974Sc17) δ: −0.05 *7* or −1.5 *2* (1974Sc17). $\gamma(\theta)$: A_2=−0.59 *12*, A_4=+0.13 *15* (1974Sc17).
	4052	11.2			(M1)	Iγ=11 (1988Ca05) Γ_γ=0.0062 eV (1974Sc17) B(M1)(W.u.)=0.0044 (1974Sc17)
	4168	2.5			M1+E2	Iγ=3 (1988Ca05) Γ_γ=0.0014 eV (1974Sc17) B(M1)(W.u.)=0.00092 (1974Sc17) δ: +0.09 *3* or +2.7 *4* (1974Sc17). $\gamma(\theta)$: A_2=+0.54 *6*, A_4=−0.08 *6* (1974Sc17).
	4349	27.1			M1+E2	Iγ=32 (1988Ca05) Γ_γ=0.015 eV (1974Sc17) B(M1)(W.u.)=0.0087 (1974Sc17) δ: −0.06 *1* or −1.5 *1* (1974Sc17). $\gamma(\theta)$: A_2=−0.61 *1*, A_4=0.00 *1* (1974Sc17).
	4483	27.8			M1+E2	Iγ=30 (1988Ca05) Γ_γ=0.0154 eV (1974Sc17) B(M1)(W.u.)=0.0082 (1974Sc17) δ: −0.13 *2* or +8.2 *8* (1974Sc17). $\gamma(\theta)$: A_2=+0.19 *2*, A_4=+0.00 *2* (1974Sc17).
	4491	0.3			(M1)[f]	Γ_γ=0.0002 eV (1974Sc17)
	6073	1.1			E2+M3	Iγ=1 (1988Ca05) Γ_γ=0.0006 eV (1974Sc17) B(E2)(W.u.)=0.0079 (1974Sc17) δ: 0.00 *10* or −1.4 *4* (1974Sc17). $\gamma(\theta)$: A_2=+0.15 *12*, A_4=+0.13 *15* (1974Sc17).
	6308	2.0			M1+E2	Iγ=3 (1988Ca05) Γ_γ=0.0011 eV (1974Sc17) B(M1)(W.u.)=0.00021 (1974Sc17) δ: +0.18 *2* or +7.1 *15* (1974Sc17). $\gamma(\theta)$: A_2=−0.32 *3*, A_4=−0.01 *3* (1974Sc17).
S(p)+1070.8	1832	5	4532			Iγ=4 (1988Ca05)
	1968	1				Iγ=3 (1988Ca05)
	2426	14				Iγ=11 (1988Ca05)
	2626	13	3730	(7/2)		Iγ=13 (1988Ca05)
	2766	4				Iγ=4 (1988Ca05)
	3028	9				Iγ=8 (1988Ca05)
	3407	2				Iγ=1 (1988Ca05)
	3481[ci]					Iγ=2 (1988Ca05)
	4010	8				Iγ=5 (1988Ca05)
	4180	3				Iγ=3 (1988Ca05)
	4361	3				Iγ=2 (1988Ca05)
	4495	6				Iγ=5 (1988Ca05)
	4503	7				Iγ=7 (1988Ca05)

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Comments
S(p)+1070.8		6320	26			Iγ=32 (1988Ca05)
S(p)+1109.6		2006	2			
		2664	2	3730	(7/2)	
		2805	4			
		3227	2			
		4048	12			
		4082	8			
		4102	3	2275.9	$1/2^+$	
		4218	6			
		4399	8			
		4541	42			
		6358	11			
S(p)+1123.3		2478	4			
		2819	4			
		3080	8			
		3387	3	3029	(7/2)	
		3458	2			
		4062	12			
		4116[g]	5	2275.9	$1/2^+$	
		4232	2			
		4413	16			
		4547[i]	<1			
		4555	29			
		6372	18			
S(p)+1164.1		3571	5			
		3710	1			
		4102	2			
		4272	2			
		4453	9			
		4587	81			
S(p)+1203.6	$5/2^-$	1238	3	5223		
		1910	1	4540	(3/2,5/2,7/2)	
		3027	4			Iγ=4 (1988Ca05)
		3557	1	2913.5	$3/2^-$	Iγ=2 (1988Ca05)
		3748	<1			Iγ=1 (1988Ca05)
		4140	3			Iγ=3 (1988Ca05)
		4194	2	2275.9	$1/2^+$	
		4633	18			Iγ=21 (1988Ca05) γ(θ): A_2=−0.73 *6*, A_4=+0.05 *7* (1988Ca05).
		6212	38			Iγ=41 (1988Ca05) γ(θ): A_2=−0.50 *5*, A_4=+0.04 *5* (1988Ca05).
		6450	30			Iγ=28 (1988Ca05) γ(θ): A_2=+0.08 *6*, A_4=−0.06 *6* (1988Ca05).
S(p)+1219.6		1583	5	4925		
		2375	2			
		2772	13	3730	(7/2)	
		3552	16			
		3625	9			
		3764	13			
		4190	2			
		4210	3	2275.9	$1/2^+$	
		4507	2			
		4641	33			
		4649	1			
		6466	1			
S(p)+1439.8		2988	5	3730	(7/2)	

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[e]	δ	Comments
S(p)+1439.8		3129	5					
		3551	2					
		3768[h]	14[h]					
		3841	9					
		4406	5	2310.0	5/2$^-$			
		4723	35					
		6682	25					
S(p)+1451.3	5/2$^-$	2868[‡]	1[b]	3835	(7/2)			
		3562	9			D+Q	0.67 *28*	$\gamma(\theta)$: A_2=+0.49 *9*, A_4=0 (1972Fo25); A_2=+0.28 *5*, A_4=+0.02 *6* (1988Ca05).
		3644	4			D+Q		δ: +6 *3* or −0.59 *9* (1972Fo25). $\gamma(\theta)$: A_2=−0.14 *11*, A_4=−0.16 *12* (1972Fo25); A_2=−0.30 *7*, A_4=+0.04 *5* (1988Ca05).
		3779	1					
		3800	1 *1*	2913.5	3/2$^-$			
		3991	1					
		4277	13			D+Q		δ: −0.01 *4* or −9 *3* (1972Fo25). $\gamma(\theta)$: A_2=−0.19 *7*, A_4=+0.13 *7* (1972Fo25); A_2=−0.31 *3*, A_4=+0.02 *4* (1988Ca05).
		4383	2					I_γ: other: 3 (1988Ca05).
		4437[i]	≤3					
		4876	8					$\gamma(\theta)$: A_2=+0.05 *8*, A_4=0 (1972Fo25); A_2=−0.22 *5*, A_4=+0.04 *6* (1988Ca05).
		6455	51			D+Q		δ: +0.08 *2* or −70 (1972Fo25). $\gamma(\theta)$: A_2=−0.26 *4*, A_4=0 (1972Fo25); A_2=−0.43 *2*, A_4=+0.09 *3* (1988Ca05).
		6693	10			D+Q		δ: −0.07 *9* or +1.5 *3* (1972Fo25). $\gamma(\theta)$: A_2=+0.38 *10*, A_4=0 (1972Fo25); A_2=+0.18 *5*, A_4=−0.18 *5* (1988Ca05).
S(p)+1460.2		3717	3	3029	(7/2)			
		4392	3					
		4426	6	2310.0	5/2$^-$			
		4446	1					
		4743	6					
		4885	5					
		6702	76					
S(p)+1481.0		1137	1	5585?				
		1839	3	4925				
		2828	6	3931.8?	3/2,5/2$^-$			
		3169	4					
		3808	27					
		4446	14	2310.0	5/2$^-$			
		4466	3					
		4582	23					
		4763	2					
		4897	6					
		4905	6					
		6722	5					
S(p)+1512.9	5/2$^-$	3622	2					
		4051	3					
		4337	13					$\gamma(\theta)$: A_2=−0.41 *5*, A_4=−0.04 *6* (1988Ca05).
		4443	2					
		4477	1	2310.0	5/2$^-$			
		4928	16					$\gamma(\theta)$: A_2=−0.61 *4*, A_4=+0.10 *5* (1988Ca05).
		4936	8					
		6515	43					$\gamma(\theta)$: A_2=−0.50 *3*, A_4=+0.07 *4* (1988Ca05).

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	E_γ	I_γ[†]	E_f	J^π_f	Comments
S(p)+1512.9	6753	12			$\gamma(\theta)$: A_2=−0.02 *7*, A_4=+0.03 *7* (1988Ca05).
S(p)+1545.0	1200	1	5585?		
	1562[g]	2	5223		
	2891	22	3931.8?	3/2,5/2$^-$	
	3232	9			
	3654[bi]	≤3[b]			
	3871	9			
	4645	13			
	4826	11			
	4960	31			
	6785	2			
S(p)+1559.8	1916	15	4925		
	3246	7			
	3885	19			
	3958	2			
	4489	4			
	4523	4	2310.0	5/2$^-$	
	4659[h]	3[h]			
	4974[h]	24[h]			
	4982	12			
	6799	10			
S(p)+1563.0	2597	4			
	3109	3	3730	(7/2)	
	3250	3			
	3889	4			
	3962[i]	<1			
	4493	3			
	4663	12			
	4844	5			
	4986	2			
	6803	64			
S(p)+1579.9	2368	5	4488.1	(5/2)	
	3527[bi]	3[b]			
	3688	17			
	3770[bi]	3[b]			
	3834[bi]	3[b]	3029	(7/2)	
	3905[bi]	2[b]			
	3978	4			
	4117	7			
	4509	9			
	4543	13	2310.0	5/2$^-$	
	4563[h]	5[h]			
	5002	35			
	6819	5			
S(p)+1600.3	2388[bi]	3[b]	4488.1	(5/2)	
	2487	4			
	2633	3			
	3286	3			
	3547	3			
	3781	1	3091.5?	1/2$^-$,3/2$^-$	
	3854	2	3029	(7/2)	
	3925	2			
	4563[h]	1[h]	2310.0	5/2$^-$	

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^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[e]	Comments
S(p)+1600.3		4699	24			D+Q	δ: +2.7 *3* or +0.10 *3* (1972Fo25). $\gamma(\theta)$: A_2=+0.55 *4*, A_4=0 (1972Fo25).
		5014	41			D+Q	δ: +12 *3* or −0.17 *2* (1972Fo25). $\gamma(\theta)$: A_2=+0.13 *3*, A_4=0 (1972Fo25).
		6839	16			D+Q	δ: −0.20 *5* or −2.3 *3* (1972Fo25); −0.05 *4* or +6.0 *25* (1967Er05). $\gamma(\theta)$: A_2=+0.12 *5*, A_4=0 (1972Fo25).
S(p)+1609.4		3863	9	3029	(7/2)		
		3955	4				
		4007	3				
		4146	4				
		4538	10				
		4708	4				
		4889	2				
		5031	33				
		6848	31				
S(p)+1678.1		2563	1				
		3784	20				
		3823	5	3130.5	$3/2^-$,$5/2^+$		
		4022	11				
		4213	15			D+Q	δ: −0.03 *1* or +4.0 *5* (1967Er05). $\gamma(\theta)$: A_2=+0.31 *6*, A_4=0 (1967Er05).
		4605	4				
		4639[i]	<1	2310.0	$5/2^-$		
		4659[h]	3[h]				
		4775	5				
		5098	7				
		6915	29			D+Q	δ: −0.08 *8* or −1.4 *3* (1967Er05). $\gamma(\theta)$: A_2=+0.54 *9*, A_4=0 (1967Er05).
S(p)+1689.3		1724	3	5223			
		3371	6				
		3504	15				
		3942	6	3029	(7/2)		
		4013	5				
		4081	10				
		4652	3	2310.0	$5/2^-$		
		4671	6				
		4788	16				
		4969	10				
		5104	7				
		5110	4				
		6927	9				
S(p)+1798	$3/2^-$	2676[‡]					I_γ: 1 (1986Di01).
		3134[&]	8[@&]	3931.8?	$3/2,5/2^-$		E_γ: other: 3141 (1986Di01).
		3474[&]	5[@&]				E_γ: other: 3480 (1986Di01).
		4116[g&]	5[@&]				E_γ: other: 4120 (1986Di01).
		4184[&]	6[@&]	2893.0	$5/2^-$		
		4891[&]	5[@&]				
		5072[&]	26[@&]			D,Q	E_γ: other: 5075 (1986Di01). $\gamma(\theta)$: A_2=−0.23 *5*, A_4=+0.04 *5* (1986Di01).
		5207[&]	10[@&]				E_γ: other: 5209 (1986Di01).
		5213[&]	1[@&]				
		7030[&]	34[@&]			D,Q	E_γ: other: 7034 (1986Di01). δ: 0.00 *5* if J(7030)=3/2 (1967Er05) +0.50 *5* if

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^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[e]	Comments
							J(7030)=5/2 (1967Er05).
							$\gamma(\theta)$: A_2=−0.15 *4*, A_4=−0.09 *5* (1986Di01).
S(p)+1810	1/2	4769	65	2310.0	5/2$^-$		$\gamma(\theta)$: A_2=+0.05 *4*, A_4=+0.01 *4* (1986Di01).
		4905	20				$\gamma(\theta)$: A_2=−0.12 *6*, A_4=−0.02 *7* (1986Di01);
		5228	15				$\gamma(\theta)$: A_2=−0.01 *6*, A_4=+0.02 *7* (1986Di01).
S(p)+1830	3/2$^-$	1874[&i]	<1[@&]	5223			
		1989[&]	1[@&]	5129	1/2$^-$,3/2$^-$		
		2137[&]	3[@&]				
		2333[&]	2[@&]	4776			
		3166[&]	7[@&]	3931.8?	3/2,5/2$^-$		E_γ: other: 3172 (1986Di01).
		3368[&]	3[@&]	3730	(7/2)		E_γ: other: 3371 (1986Di01).
		3506[&]	3[@&]				E_γ: other: 3511 (1986Di01).
		3768[h&]	2[h@&]				E_γ: other: 3773 (1986Di01).
		3931[&]	2[@&]				E_γ: other: 3934 (1986Di01).
		4011[&]	2[@&]	3091.5?	1/2$^-$,3/2$^-$		
		4077[&]	2[@&]	3029	(7/2)		
		4148[&]	1[@&]				
		4216[&]	4[@&]	2893.0	5/2$^-$		
		4646[&]	1[@&]				
		4750[&]	2[@&]				
		4787[&]	3[@&]	2310.0	5/2$^-$		
		4806[&]	2[@&]				
		5239[&]	26[@&]				E_γ: other: 5240 (1986Di01).
							$\gamma(\theta)$: A_2=−0.19 *3*, A_4=0 (1967Er05).
		6824[&]	2[@&]				
		7062[&]	30[@&]			D+Q	δ: −0.28 *6* if J(7062)=3/2; −1.0 *4* or −4.7 *20* if J(7062)=5/2 (1967Er05).
							$\gamma(\theta)$: A_2=−0.42 *5*, A_4=0 (1967Er05).
S(p)+1872	5/2,7/2$^-$	4192	7				
		4231	10	2913.5	3/2$^-$		
		4404	5				
		4796	39				
		5289	10				
		6869	18				$\gamma(\theta)$: A_2=−0.22 *6*, A_4=+0.03 *6* (1986Di01).
		7106	11				$\gamma(\theta)$: A_2=+0.47 *6*, A_4=−0.09 *6* (1986Di01).
S(p)+1895	1/2	2771	1				
		4215	3				
		4989	18				$\gamma(\theta)$: A_2=+0.05 *4*, A_4=−0.05 *5* (1986Di01).
		5170	69				$\gamma(\theta)$: A_2=+0.02 *2*, A_4=−0.02 *2* (1986Di01).
		5304	9				$\gamma(\theta)$: A_2=+0.04 *5*, A_4=−0.02 *2* (1986Di01).
S(p)+1908	5/2$^-$	2783	5				
		2988	2	4200	(1/2,3/2)		
		3248	5	3931.8?	3/2,5/2$^-$		
		3718	9				
		4725	8				
		4885	19			D,Q	$\gamma(\theta)$: A_2=+0.80 *5*, A_4=−0.23 *5* (1986Di01).
		6001	7				
		6904	42			D,Q	$\gamma(\theta)$: A_2=−0.48 *4*, A_4=−0.08 *4* (1986Di01).
		7141	3				
S(p)+1913	3/2$^-$	2788	5				
		2940	13				

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[e]	Comments
S(p)+1913	3/2$^-$	4232	12			D	$\gamma(\theta)$: A_2=+0.10 *5*, A_4=−0.01 *5* (1986Di01).
		5187	46			D,Q	$\gamma(\theta)$: A_2=+0.17 *4*, A_4=−0.03 *4* (1986Di01).
		5329	10				
		6909	7				
		7146	7				
S(p)+1929	1/2$^-$	2239	2				
		2439	1	4776			
		2692	3	4532			
		3608	5				
		4248	2				
		4321	3				
		4852	8				
		4906	5				
		5022	3				
		5203	3				$\gamma(\theta)$: A_2=+0.03 *2*, A_4=+0.02 *2* (1986Di01).
		5337	3				
		7162	64				$\gamma(\theta)$: A_2=−0.06 *1*, A_4=+0.03 *1* (1986Di01).
S(p)+1936	1/2$^-$	2696	3	4532			
		2811	5				
		3276	8	3931.8?	3/2,5/2$^-$		
		3615	4				
		4255	16				
		4328	3				
		5029	11				$\gamma(\theta)$: A_2=+0.01 *6*, A_4=−0.07 *6* (1986Di01).
		5210	44				$\gamma(\theta)$: A_2=+0.04 *4*, A_4=0.00 *4* (1986Di01).
		5344	4				
		7169	2				$\gamma(\theta)$: A_2=−0.09 *5*, A_4=+0.16 *6* (1986Di01).
S(p)+1937	5/2$^-$	3616[d]	11[d]				
		5030[d]	30[d]				
		5345[d]	11[d]				
		6933[d]	41[d]			D+Q	$\gamma(\theta)$: A_2=−0.51 *6*, A_4=+0.02 *6* (1986Di01).
		7170[d]	7[d]			D+Q	$\gamma(\theta)$: A_2=−0.51 *6*, A_4=+0.02 *6* (1967Er05).
S(p)+1942	5/2	3350	4	3877	(3/2,5/2)		
		4044	1				
		4261	33				
		4473	8				
		4759	5				
		4865	5				
		4899	18	2310.0	5/2$^-$		
		6938	24			D,Q	$\gamma(\theta)$: A_2=−0.04 *3*, A_4=−0.13 *2* (1986Di01).
		7175	29			D,Q	$\gamma(\theta)$: A_2=+0.51 *3*, A_4=−0.17 *3* (1986Di01).
S(p)+1943	5/2$^+$	2726[d]	9[d]	4488.1	(5/2)		
		3023[d]	9[d]	4200	(1/2,3/2)		
		3130[d]	5[d]	4091.2?	(5/2$^-$,7/2$^-$)		
		4283[d]	22[d]				$\gamma(\theta)$: A_2=+0.09 *3*, A_4=−0.07 *3* (1967Er05).
		5036[d]	10[d]				$\gamma(\theta)$: A_2=+0.07 *5*, A_4=−0.20 *5* (1967Er05).
		5359[d]	18[d]				
S(p)+1958	3/2$^-$	2016	3	5212?			
		2061	15	5174	(1/2,3/2,5/2)		
		2116	11	5129	1/2$^-$,3/2$^-$		
		2702	7	4532			
		3898	10				
		4488	4				
		5050	20				$\gamma(\theta)$: A_2=+0.82 *5*, A_4=+0.32 *6* (1986Di01).

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

γ(^{51}Mn) (continued)

E_i(level)	J_i^π	E_γ	I_γ [†]	E_f	J_f^π	Mult.[e]	Comments
S(p)+1958	3/2$^-$	5231	4				
		5365	11				
		6953	2				
		7190	20				
S(p)+1978	(5/2)	2722	1	4532			
		4794	39				
		5070	32				
		5385	22				
S(p)+1981	(1/2,3/2)	2855	12				
		3013	25				
		4299	16				
		4937	30	2310.0	5/2$^-$		
		5396	17				
S(p)+1990		4237	35	3029	(7/2)		
		7222	65				
S(p)+2009	5/2$^{(+)}$	3234	7	4046			
		3347	7	3931.8?	3/2,5/2$^-$		
		3817	8				
		3948	18				
		4326	4				
		4824	2				
		4964	2	2310.0	5/2$^-$		
		5415	6				
		5423	4				
		7003	18				
		7240	24			D	γ(θ): A_2=+0.55 *6*, A_4=−0.16 *7* (1986Di01).
S(p)+2030	5/2$^-$	2721	2				
		2811	3	4488.1	(5/2)		
		3215	5	4091.2?	(5/2$^-$,7/2$^-$)		
		4130	9			D,Q	γ(θ): A_2=+0.36 *3*, A_4=−0.01 *4* (1986Di01).
		4347	1				
		4368	3				
		4559	19			D,Q	γ(θ): A_2=−0.11 *2*, A_4=+0.11 *2* (1986Di01).
		4845	1				
		4951	3				
		4985	1	2310.0	5/2$^-$		
		5121	12				
		5302	10				
		5436	6				
		5444	17				
		7024	7			D	γ(θ): A_2=−0.10 *2*, A_4=+0.04 *2* (1986Di01).
		7261	1			D,Q	γ(θ): A_2=+0.11 *10*, A_4=−0.02 *11* (1986Di01).
S(p)+2031	3/2$^-$	2071[&]	13[@&]	5223			
		2085[&i]	<1[@&]	5212?			
		2130[&]	4[@&]	5174	(1/2,3/2,5/2)		
		2186[&i]	<1[@&]	5129	1/2$^-$,3/2$^-$		
		2334[&]	1[@&]				
		3056[&]	4[@&]				
		3207[&]	1[@&]	4091.2?	(5/2$^-$,7/2$^-$)		
		3565[&]	1[@&]	3730	(7/2)		
		4128[&]	9[@&]				
		4367[&]	2[@&]				
		4544[&]	2[@&]				

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[e]	δ	Comments
S(p)+2031	3/2$^-$	4557[&]	12[@&]					
		4843[&]	2[@&]					
		4984[&]	4[@&]	2310.0	5/2$^-$			
		5120[&]	4[@&]					$\gamma(\theta)$: A_2=−0.02 *3*, A_4=+0.05 *3* (1986Di01).
		5301[&]	8[@&]					$\gamma(\theta)$: A_2=−0.01 *3*, A_4=+0.09 *3* (1986Di01).
		5442[&]	17[@&]					
		7021[&]	11[@&]					
		7259[&]	4[@&]					
S(p)+2042	5/2	2197[&]	2[@&]	5129	1/2$^-$,3/2$^-$			
		2383[&i]	<1[@&]	4925				
		3067[&]	5[@&]					
		3374[&]	6[@&]	3931.8?	3/2,5/2$^-$			
		4285[&]	20[@&]	3029	(7/2)	D+Q		δ: +0.49 *11* or −6.3 *23* (1975Di10). $\gamma(\theta)$: A_2=−0.02 *5*, A_4=−0.21 *5* (1975Di10).
		4356[&]	1[@&]					
		4424[&]	8[@&]	2893.0	5/2$^-$			
		4568[&]	3[@&]					
		4958[&]	3[@&]					$\gamma(\theta)$: A_2=+0.16 *4*, A_4=0.00 *4* (1986Di01).
		5014[&]	4[@&]					
		5131[&]	9[@&]			D+Q	−0.30 *7*	δ: from 1975Di10. $\gamma(\theta)$: A_2=+0.03 *6*, A_4=−0.11 *6* (1975Di10).
		5312[&]	7[@&]					
		5447	8			D+Q	−0.29 *5*	δ: from 1975Di10. $\gamma(\theta)$: A_2=+0.15 *5*, A_4=+0.13 *6* (1975Di10).
		7032[&]	5[@&]			D+Q		δ: −0.18 *8* or +5 *+9−3* (1975Di10). $\gamma(\theta)$: A_2=−0.02 *5*, A_4=−0.16 *5* (1975Di10). $\gamma(\theta)$: A_2=−0.17 *2*, A_4=+0.08 *2* (1986Di01).
		7270[&]	18[@&]			D+Q	+0.60 *2*	δ: from 1975Di10. $\gamma(\theta)$: A_2=−0.20 *4*, A_4=−0.11 *4* (1975Di10).
S(p)+2043	3/2$^-$	3068[d]	5[d]					
		3381[d]	5[d]	3931.8?	3/2,5/2$^-$	D		$\gamma(\theta)$: A_2=+0.32 *5*, A_4=+0.08 *6* (1986Di01,1967Er05).
		3580[d]	2[d]	3730	(7/2)	D,Q		$\gamma(\theta)$: A_2=+0.14 *11*, A_4=−0.01 *11* (1986Di01,1967Er05).
		4289[d]	18[d]	3029	(7/2)	D,Q		$\gamma(\theta)$: A_2=−0.03 *3*, A_4=−0.03 *3* (1986Di01,1967Er05).
		4433[d]	6[d]			D,Q		$\gamma(\theta)$: A_2=−0.68 *7*, A_4=+0.03 *3* (1986Di01,1967Er05).
		4572[d]	4[d]					
		5018[d]	5[d]					
		5314[d]	12[d]					
		5315[d]	10[d]			D		$\gamma(\theta)$: A_2=−0.57 *3*, A_4=+0.01 *3* (1986Di01,1967Er05).
		5449[d]	10[d]			D		$\gamma(\theta)$: A_2=+0.43 *3*, A_4=+0.04 *3* (1986Di01,1967Er05).
		7274[d]	23[d]			D,Q		$\gamma(\theta)$: A_2=−0.35 *2*, A_4=0.00 *2* (1986Di01,1967Er05).
S(p)+2066	3/2$^-$	2122	2	5212?				

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[e]	Comments
S(p)+2066	3/2$^-$	2413	6	4925		D,Q	$\gamma(\theta)$: A_2=−0.44 *12*, A_4=−0.13 *11* (1986Di01).
		2808	6	4532			
		3742	3				
		4311	7	3029	(7/2)	D	$\gamma(\theta)$: A_2=−0.03 *7*, A_4=+0.01 *8* (1986Di01).
		5040	22			D	$\gamma(\theta)$: A_2=−0.10 *3*, A_4=+0.03 *3* (1986Di01).
		5156	3				
		5337	34			D	$\gamma(\theta)$: A_2=+0.36 *2*, A_4=+0.06 *2* (1986Di01).
		5471	6				
		5479	1				
		7296	10			D,Q	$\gamma(\theta)$: A_2=+0.39 *4*, A_4=−0.05 *4* (1986Di01).
S(p)+2080	5/2$^+$	3157	9	4200	(1/2,3/2)		
		3485	10	3877	(3/2,5/2)	D,Q	$\gamma(\theta)$: A_2=+0.11 *5*, A_4=+0.13 *6* (1986Di01).
		4325	14	3029	(7/2)		
		4396	8				
		4894	4				
		5000	13				
		5054	5				
		5493	31				
		7073	6				
S(p)+2084		3620	11	3730	(7/2)		
		4473	16				
		5174	35				
		5355	20				
		5489	18				
S(p)+2110		5063	82	2310.0	5/2$^-$		
		5522	18				
S(p)+2113	3/2$^+$	5066		2310.0	5/2$^-$	D,Q	$\gamma(\theta)$: A_2=−0.13 *4*, A_4=−0.08 *4* (1986Di01).
S(p)+2114	3/2$^-$,5/2$^-$	4359		3029	(7/2)	D	$\gamma(\theta)$: A_2=+0.01 *2*, A_4=−0.09 *2* (1986Di01,1967Er05).
		5203				D	$\gamma(\theta)$: A_2=+0.27 *11*, A_4=+0.19 *12* (1986Di01,1967Er05).
		5518				D	$\gamma(\theta)$: A_2=+0.32 *3*, A_4=+0.02 *4* (1986Di01).
		7343				D,Q	$\gamma(\theta)$: A_2=+0.09 *3*, A_4=+0.01 *4* (1986Di01,1967Er05).
S(p)+2128	5/2$^-$	3532	3	3877	(3/2,5/2)		
		4464	3				
		4655	69			D	$\gamma(\theta)$: A_2=−0.24 *3*, A_4=+0.07 *3* (1986Di01).
		5047	6			D,Q	$\gamma(\theta)$: A_2=+0.59 *7*, A_4=+0.03 *7* (1986Di01).
		5101	7			D,Q	$\gamma(\theta)$: A_2=+0.63 *11*, A_4=+0.07 *11* (1986Di01).
		5217	2				
		5540	6			D	$\gamma(\theta)$: A_2=+0.62 *9*, A_4=+0.27 *7* (1986Di01).
		7357	4			D,Q	$\gamma(\theta)$: A_2=+0.70 *10*, A_4=+0.03 *10* (1986Di01).
S(p)+2141	3/2$^+$,5/2$^-$	4321	8	3091.5?	1/2$^-$,3/2$^-$		
		4385	43	3029	(7/2)	D,Q	$\gamma(\theta)$: A_2=+0.20 *2*, A_4=0.00 *2* (1986Di01).
		5060	23				
		5545	26			D,Q	$\gamma(\theta)$: A_2=+0.13 *1*, A_4=+0.04 *2* (1986Di01).
S(p)+2142	3/2$^-$	2297[d]	2[d]	5129	1/2$^-$,3/2$^-$		
		2648[d]	1[d]	4776			
		3031[d]	2[d]				
		3165[d]	2[d]				
		3478[d]	5[d]	3931.8?	3/2,5/2$^-$		
		4079[d]	9[d]			D	$\gamma(\theta)$: A_2=−0.04 *5*, A_4=−0.06 *6* (1986Di01,1967Er05).
		4386[d]	23[d]	3029	(7/2)		
		4457[d]	20[d]			D	$\gamma(\theta)$: A_2=+0.41 *2*, A_4=+0.02 *3* (1986Di01,1967Er05).
		5095[d]	6[d]	2310.0	5/2$^-$		
		5231[d]	13[d]			D	$\gamma(\theta)$: A_2=+0.31 *2*, A_4=+0.07 *3* (1986Di01,1967Er05).
		5546[d]	17[d]				

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[e]	Comments
S(p)+2142	3/2$^-$	7371[d]	19[d]			D	$\gamma(\theta)$: A_2=+0.05 *3*, A_4=+0.02 *2* (1986Di01,1967Er05).
S(p)+2167	3/2$^-$,5/2$^-$	4103	62				
		7395	38				
S(p)+2187	5/2$^+$	3589		3877	(3/2,5/2)	D	$\gamma(\theta)$: A_2=+0.11 *5*, A_4=−0.13 *6* (1986Di01).
		5104				D	$\gamma(\theta)$: A_2=+0.55 *3*, A_4=−0.08 *3* (1986Di01).
S(p)+2187	3/2$^-$	2875	1				
		3522	1	3931.8?	3/2,5/2$^-$		
		3590	7	3877	(3/2,5/2)		
		3861	1				
		4501	2				
		4522	2				
		4713	4				
		4999	9				
		5105	21				
		5275	6				
		5456	15			D,Q	$\gamma(\theta)$: A_2=+0.08 *6*, A_4=+0.08 *6* (1986Di01,1967Er05).
		5590	6				
		5598	10			D,Q	$\gamma(\theta)$: A_2=−0.57 *5*, A_4=−0.05 *5* (1986Di01,1967Er05).
		7178	7			Q	$\gamma(\theta)$: A_2=+0.12 *6*, A_4=−0.21 *7* (1986Di01,1967Er05).
		7415	8			D,Q	$\gamma(\theta)$: A_2=+0.22 *6*, A_4=−0.05 *7* (1986Di01,1967Er05).
S(p)+2220	3/2$^-$	4316	10				
		5137	18			D	$\gamma(\theta)$: A_2=−0.19 *6*, A_4=−0.13 *7* (1986Di01).
		5171	25			D	$\gamma(\theta)$: A_2=−0.21 *3*, A_4=+0.06 *4* (1986Di01).
		5630	41				
		7447	6			D	$\gamma(\theta)$: A_2=−0.07 *6*, A_4=0.00 *7* (1986Di01).
S(p)+2223	3/2$^-$	2963	4	4532			
		3092	2				
		4465	3	3029	(7/2)		
		4609	5	2893.0	5/2$^-$		
		5140	3				
		5194	3				
		5310	53			D,Q	$\gamma(\theta)$: A_2=+0.74 *4*, A_4=+0.10 *4* (1986Di01).
		5625	15			D,Q	$\gamma(\theta)$: A_2=+0.74 *6*, A_4=+0.04 *6* (1986Di01).
		7213	2				
		7450	10			D,Q	$\gamma(\theta)$: A_2=−0.70 *8*, A_4=+0.14 *7* (1986Di01).
S(p)+2232	5/2	4328	10				
		4476	16	3029	(7/2)		
		4757	27			D	$\gamma(\theta)$: A_2=−0.33 *5*, A_4=−0.16 *5* (1986Di01).
		5003	3				
		5043	11				
		5149	6				
		5634	14			D	$\gamma(\theta)$: A_2=−0.18 *5*, A_4=−0.20 *5* (1986Di01).
		7222	5			D	$\gamma(\theta)$: A_2=−0.25 *15*, A_4=+0.12 *17* (1986Di01).
		7459	8				
S(p)+2236		7226	47				
		7459	53				
S(p)+2240	1/2$^-$	2584	1	4925			
		3574	2	3931.8?	3/2,5/2$^-$		
		3773	6	3730	(7/2)		
		4553	38				$\gamma(\theta)$: A_2=+0.02 *4*, A_4=+0.03 *4* (1986Di01).
		5191	4				
		5327	4				
		5508	4				
		5650	31				$\gamma(\theta)$: A_2=+0.08 *4*, A_4=+0.04 *4* (1986Di01).
		7467	10				$\gamma(\theta)$: A_2=+0.06 *11*, A_4=+0.17 *13* (1986Di01).
S(p)+2288	5/2$^-$	3508	1	4052?			

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[e]	Comments
S(p)+2288	5/2$^-$	3689	6	3877	(3/2,5/2)	D	$\gamma(\theta)$: A_2=+0.07 *12*, A_4=−0.23 *13* (1986Di01).
		4465	8	3091.5?	1/2$^-$,3/2$^-$		$\gamma(\theta)$: A_2=−0.03 *15*, A_4=−0.13 *16* (1986Di01).
		5204	16			D,Q	$\gamma(\theta)$: A_2=+0.26 *4*, A_4=−0.16 *5* (1986Di01).
		5374	20			D	$\gamma(\theta)$: A_2=−0.24 *4*, A_4=+0.02 *5* (1986Di01).
		5697	5				
		7277	44			D	$\gamma(\theta)$: A_2=−0.01 *3*, A_4=−0.10 *3* (1986Di01).
S(p)+2303	3/2$^-$,5/2$^-$	2400	2	5174	(1/2,3/2,5/2)		
		3171	2				
		3636	2	3931.8?	3/2,5/2$^-$		
		3975	7				
		4237	6				
		4615	3				
		4688	9	2893.0	5/2$^-$		
		4827	3				
		5219	5				
		5273	19				
		5389	11			D,Q	$\gamma(\theta)$: A_2=+0.54 *5*, A_4=+0.01 *5* (1986Di01).
		5570	11			D,Q	$\gamma(\theta)$: A_2=−1.05 *6*,A_4=+0.07 *5* (1986Di01).
		7292	2				
		7529	18			D	$\gamma(\theta)$: A_2=−0.6 *3*, A_4=+0.05 *4* (1986Di01).
S(p)+2321	5/2	4254	2				
		5236	6				
		7309	53			D	$\gamma(\theta)$: A_2=−0.11 *2*, A_4=−0.04 *2* (1986Di01).
		7546	39			D	$\gamma(\theta)$: A_2=+0.53 *4*, A_4=+0.08 *5* (1986Di01).
S(p)+2325	1/2$^-$	3657	3	3931.8?	3/2,5/2$^-$		
		3856	3	3730	(7/2)		
		3996	3				
		4636	40				$\gamma(\theta)$: A_2=+0.08 *3*, A_4=−0.14 *3* (1986Di01).
		4848	3				
		5410	27				$\gamma(\theta)$: A_2=+0.04 *3*, A_4=−0.07 *4* (1986Di01).
		5591	4				
		5725	16				$\gamma(\theta)$: A_2=+0.05 *6*, A_4=0.00 *7* (1986Di01).
		7550	1				
S(p)+2335	3/2$^-$,5/2$^-$	3072	3	4532			
		3354	2				
		3554	7	4052?			
		3667	3	3931.8?	3/2,5/2$^-$		
		4229	1				
		4268	18				
		4719	2	2893.0	5/2$^-$		
		4858	1				
		5304	14	2310.0	5/2$^-$	D	$\gamma(\theta)$: A_2=−0.03 *7*, A_4=−0.01 *7* (1986Di01).
		5420	27			D	$\gamma(\theta)$: A_2=+0.46 *4*, A_4=+0.03 *4* (1986Di01).
		5601	2				
		5735	4				
		7323	9				
		7560	7			D,Q	$\gamma(\theta)$: A_2=+0.33 *7*, A_4=+0.03 *8* (1986Di01).
S(p)+2347		2443	8	5174	(1/2,3/2,5/2)		
		3122	5	4488.1	(5/2)		
		3747	7	3877	(3/2,5/2)		
		4870	22				
		5296	19				
		5432	8				
		5747	16				
		7335	13				
		7572	2				
S(p)+2362		3380	3				

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[e]	Comments
S(p)+2362		3693	9	3931.8?	3/2,5/2$^-$		
		4672	31				
		4745	37	2893.0	5/2$^-$		
		5446	7				
		5761	13				
S(p)+2375		5640	28				
		5774	58				
		7599	14				
S(p)+2394	1/2	5342	20				$\gamma(\theta)$: A_2=−0.03 *7*, A_4=+0.02 *8* (1986Di01).
		5478	10				$\gamma(\theta)$: A_2=+0.02 *10*, A_4=−0.01 *9* (1986Di01).
		5801	70				$\gamma(\theta)$: A_2=+0.03 *2*, A_4=+0.06 *2* (1986Di01).
S(p)+2397	7/2$^+$	3666	2	4000?			
		3786	5	3877	(3/2,5/2)		
		4592	6				
		5205	11			D	$\gamma(\theta)$: A_2=−0.12 *9*, A_4=−0.07 *9* (1986Di01).
		6133	8				
		6481	45			D	$\gamma(\theta)$: A_2=+0.50 *2*, A_4=−0.03 *2* (1986Di01).
		7384	23			D	$\gamma(\theta)$: A_2=+0.11 *4*, A_4=−0.06 *4* (1986Di01).
S(p)+2407	5/2$^-$	3754	2	3931.8?	3/2,5/2$^-$		
		3806	2	3877	(3/2,5/2)		
		4208	2				
		4500	8				
		4582	15	3091.5?	1/2$^-$,3/2$^-$	D,Q	$\gamma(\theta)$: A_2=−0.01 *6*, A_4=−0.02 *6* (1986Di01).
		5215	7			D	$\gamma(\theta)$: A_2=+0.60 *10*, A_4=−0.18 *10* (1986Di01).
		5321	9			D	$\gamma(\theta)$: A_2=+0.46 *5*, A_4=−0.13 *5* (1986Di01).
		5491	10			D	$\gamma(\theta)$: A_2=−0.25 *6*, A_4=+0.05 *6* (1986Di01).
		5814	3				
		7394	31			D,Q	$\gamma(\theta)$: A_2=+0.17 *2*, A_4=0.00 *2* (1986Di01).
		7631	11			D	$\gamma(\theta)$: A_2=+0.49 *4*, A_4=−0.05 *4* (1986Di01).
S(p)+2412		4505	37				
		5326	15				
		7399	16				
		7636	32				
S(p)+2420		4729	15				
		5503	20				
		5684	21				
		5818	25				
S(p)+2446		7432	62				
		7669	38				
S(p)+2461		4130	12				
		4392	8				
		4699	18	3029	(7/2)		
		4843	19	2893.0	5/2$^-$		
		5544	19				
		5725	13				
		7684	11				
S(p)+2477	5/2$^+$	4997	3				
		5389	8			D	$\gamma(\theta)$: A_2=+0.44 *17*, A_4=+0.03 *18* (1986Di01).
		5443	3	2310.0	5/2$^-$		
		5882	11			D	$\gamma(\theta)$: A_2=−0.50 *31*, A_4=−0.17 *29* (1986Di01).
		7462	27			D	$\gamma(\theta)$: A_2=−0.10 *8*, A_4=−0.02 *8* (1986Di01).
		7699	48			D	$\gamma(\theta)$: A_2=+0.41 *5*, A_4=−0.14 *6* (1986Di01).
S(p)+2493	3/2$^-$	3227	4	4540	(3/2,5/2,7/2)		
		3515	8				
		3562	4	4200	(1/2,3/2)		
		5234	11				
		5756	60				

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ †	E_f	J_f^π	Mult.[e]	Comments
S(p)+2493	3/2$^-$	7715	13				$\gamma(\theta)$: A_2=−0.51 *8*, A_4=+0.05 *9* (1988Di03).
S(p)+2496		5013	100				
S(p)+2507	3/2$^-$	3234	2	4540	(3/2,5/2,7/2)		
		3516	4				
		4737	6	3048.6	(3/2$^-$)		
		4881	5	2893.0	5/2$^-$		
		5306	16			D,Q	$\gamma(\theta)$: A_2=−0.045 *15*, A_4=+0.23 *16* (1986Di01).
		5763	43			D	$\gamma(\theta)$: A_2=−0.73 *5*, A_4=+0.07 *4* (1986Di01).
		5897	15			D,Q	$\gamma(\theta)$: A_2=+0.75 *27*, A_4=+0.18 *29* (1986Di01).
		7722	9			D,Q	$\gamma(\theta)$: A_2=−0.52 *14*, A_4=+0.06 *13* (1986Di01).
S(p)+2521	1/2	3589	6	4200	(1/2,3/2)		
		3849	2	3955	(7/2,9/2)		
		4048	5	3730	(7/2)		
		4828	4				
		5040	6				
		5432	3				
		5602	21				$\gamma(\theta)$: A_2=−0.19 *12*, A_4=+0.04 *14* (1988Di03).
		5783	21				$\gamma(\theta)$: A_2=−0.05 *7*, A_4=+0.07 *7* (1988Di03).
		5917	23				$\gamma(\theta)$: A_2=+0.06 *6*, A_4=−0.10 *7* (1986Di01).
		7504	1				
		7742	2				
S(p)+2566	5/2$^-$	4802	16	3029	(7/2)		
		5962	30				$\gamma(\theta)$: A_2=+0.79 *21*, A_4=−0.57 *15* (1988Di03).
		7549	32				$\gamma(\theta)$: A_2=−0.21 *18*, A_4=−0.18 *8* (1988Di03).
		7787	22				$\gamma(\theta)$: A_2=+0.22 *18*, A_4=−0.46 *11* (1988Di03).
S(p)+2571	5/2	4661	2				
		4807	6	3029	(7/2)		
		5376	15				$\gamma(\theta)$: A_2=−0.01 *5*, A_4=−0.06 *6* (1988Di03).
		5536	6	2310.0	5/2$^-$		
		5652	6				$\gamma(\theta)$: A_2=−0.44 *4*, A_4=+0.10 *5* (1988Di03).
		7554	21				$\gamma(\theta)$: A_2=−0.17 *3*, A_4=−0.03 *2* (1988Di03).
		7792	44				$\gamma(\theta)$: A_2=+0.52 *2*, A_4=+0.02 *2* (1988Di03).
S(p)+2625		4713	30				
		5142	22				
		5534	11				
		6019	20				
		7606	6				
		7844	11				
S(p)+2630	3/2$^-$	2785	6	5129	1/2$^-$,3/2$^-$		
		3497	4				
		3644	4				
		3956	2	3955	(7/2,9/2)		
		4295	5				
		4557	6				
		4864	12	3029	(7/2)		
		5539	3				
		5593	9	2310.0	5/2$^-$		
		5709	6				
		6024	15				$\gamma(\theta)$: A_2=+0.22 *5*, A_4=−0.25 *6* (1988Di03).
		7849	28				$\gamma(\theta)$: A_2=−0.50 *3*, A_4=+0.08 *4* (1988Di03).
S(p)+2669		2754	4	5188?			
		2823	4	5129	1/2$^-$,3/2$^-$		
		3004	13	4925			
		3148	4	4776			
		3286	4				
		4193	8	3730	(7/2)		
		6062	7				

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ †	E_f	J_f^π	Comments
S(p)+2669		7887	56			
S(p)+2676		3012	3	4925		
		4472	9			
		4603	3			
		4764	5			
		4981	5			
		5936	9			
		6070	45			
		7895	21			
S(p)+2696		2785	5	5188?		
		2987	4			
		4220	5	3730	(7/2)	
		4491	8			
		5658	16	2310.0	$5/2^-$	
		5774	25			
		5955	17			
		7676	8			
		7914	12			
S(p)+2715	$3/2^-$,$5/2^-$,7/2	4652	11			
		5231	21			$\gamma(\theta)$: A_2=+0.59 *12*, A_4=−0.42 *12* (1988Di03).
		5623	11			
		6116	36			
		7933	21			$\gamma(\theta)$: A_2=−0.24 *6*, A_4=−0.20 *7* (1988Di03).
S(p)+2726	$3/2^-$	3728	3			
		4802	3			
		4948	2	3048.6	$(3/2^-)$	
		5677	3			
		5793	6			$\gamma(\theta)$: A_2=+0.80 *6*, A_4=+0.02 *6* (1988Di03).
		6108	68			
		7944	15			$\gamma(\theta)$: A_2=+0.23 *3*, A_4=+0.03 *3* (1988Di03).
S(p)+2751		6142	29			
		7967	71			
S(p)+2798	9/2	3274	3	4776		
		3550	3	4532		
		4013	3	4052?		
		4176	4	3893.2	$1/2^-$,$3/2^-$	
		4283	2			
		5120	2			
		6525	27			$\gamma(\theta)$: A_2=−0.35 *3*, A_4=+0.05 *3* (1988Di03).
		6873	6			$\gamma(\theta)$: A_2=+0.20 *11*, A_4=+0.33 *13* (1988Di03).
		7775	50			$\gamma(\theta)$: A_2=−0.20 *2*, A_4=+0.01 *2* (1988Di03).
S(p)+2807		7785	28			
		8023	46			
S(p)+2830	$3/2^-$	5769	32			$\gamma(\theta)$: A_2=−0.13 *4*, A_4=−0.05 *4* (1988Di03).
		5903	23			$\gamma(\theta)$: A_2=+0.28 *7*, A_4=−0.02 *7* (1988Di03).
		6220	20			$\gamma(\theta)$: A_2=−0.19 *4*, A_4=−0.00 *5* (1988Di03).
		8045	25			$\gamma(\theta)$: A_2=−0.11 *4*, A_4=+0.15 *5* (1988Di03).
S(p)+2849	3/2	2990	15	5129	$1/2^-$,$3/2^-$	
		3000	3			
		3181	4	4925		
		3702	3			
		3712	2			
		3859	2			
		4510	6			
		4641	3			
		5362	2			
		5754	2			

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ †	E_f	J_f^π	Comments
S(p)+2849	3/2	5808	6	2310.0	5/2$^-$	
		5924	10			
		6105	20			$\gamma(\theta)$: A_2=−0.58 *6*, A_4=+0.07 *7* (1988Di03).
		6239	17			
		8064	5			
S(p)+2887		4971	8			
		5209	8			
		5400	13			
		5846	4	2310.0	5/2$^-$	
		5962	2			
		7864	4			
		8102	61			
S(p)+2930	7/2$^-$	4851	9			
		4862	11			
		5012	9			
		5302	12	2893.0	5/2$^-$	
		5833	10			
		7003	30			$\gamma(\theta)$: A_2=+0.31 *5*, A_4=−0.01 *6* (1988Di03).
		7905	30			$\gamma(\theta)$: A_2=+0.20 *5*, A_4=+0.09 *5* (1988Di03).
		8143	19			$\gamma(\theta)$: A_2=+0.12 *10*, A_4=+0.31 *12* (1988Di03).
S(p)+2934	3/2$^-$,5/2$^-$,7/2	2973	4	5223		
		3073	4	5129	1/2$^-$,3/2$^-$	
		3408	13	4776		
		3624	4			
		3659	4	4540	(3/2,5/2,7/2)	
		4593	8			
		6322	7			
		8147	56			$\gamma(\theta)$: A_2=−0.36 *2*, A_4=+0.05 *2* (1988Di03).
S(p)+2956	3/2$^-$,5/2	5753	9			
		5859	9			
		7931	42			
		8169	40			$\gamma(\theta)$: A_2=+0.23 *3*, A_4=+0.17 *4* (1988Di03).
S(p)+2962	3/2,5/2$^-$	3000	2	5223		
		3291	9	4925		
		3812	4			
		4281	2	3955	(7/2,9/2)	
		4349	4	3877	(3/2,5/2)	
		4480	4	3730	(7/2)	
		4882	4			
		6034	5			
		6357	20			
		8174	46			$\gamma(\theta)$: A_2=−0.13 *2*, A_4=+0.05 *2* (1988Di03).
S(p)+2974		4034	2	4206.1	(5/2)	
		5346	3	2893.0	5/2$^-$	
		5485	10			
		5771	3			
		5877	26			
		6047	7			
		6370	20			
		7949	10			
		8187	19			
S(p)+2987		3025	14	5223		
		3272	5			
		4505	11	3730	(7/2)	
		5214	23	3048.6	(3/2$^-$)	
		5285	4			
		5358	8	2893.0	5/2$^-$	

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[e]	δ	Comments
S(p)+2987		5923	7					
		6240	19					
		6382	7					
		7961	2					
S(p)+3004	3/2$^-$,5/2$^-$	3087	3	5188?				
		3693	4					
		4062	3	4206.1	(5/2)			
		4323	3	3955	(7/2,9/2)			
		4662	3					
		5085	3					
		5302	9					
		5375	10	2893.0	5/2$^-$			
		6076	31					$\gamma(\theta)$: A_2=+0.15 *4*, A_4=−0.04 *5* (1988Di03).
		6257	17					$\gamma(\theta)$: A_2=−0.62 *7*, A_4=+0.06 *8* (1988Di03).
		7978	7					$\gamma(\theta)$: A_2=+0.30 *13*, A_4=−0.54 *14* (1988Di03).
		8216	7					$\gamma(\theta)$: A_2=−0.11 *12*, A_4=−0.23 *15* (1988Di03).
S(p)+3045		5125	9					
		5946	76					
		6297	8					
		8256	7					
S(p)+3049	5/2,7/2$^-$,9/2	3737	6					
		4435	20	3877	(3/2,5/2)			
		4979	10					
		5419	7	2893.0	5/2$^-$			

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	E_γ	I_γ †
S(p)+3049	8022	
S(p)+3055	4113	21
	4985	19
	5217	6
	8028	46
S(p)+3058	4256	1
	4330	1
	4434	1
	4715	2
	4846	2
	5220	5
	5355	2
	5853	3
	6013	1
	6129	6
	8031	16
	8269	48
S(p)+3097	3133	5
	3178	7
	3945	4
	4107	3
	4753	5
	5176	10
	5466	12
	5997	7
	6167	5
	6348	11
	8307	20
S(p)+3172.3	3604	18
	3848	20
	4227	19
	8142	14
S(p)+3192.2	5506	21
	6911	26
	8161	36
S(p)+3246.1	3677	16
	3921	15
	4300	8
	5560	9
	6037	12
	6965	23
	8215	9
S(p)+3258.6	3686	16
	3930	11
	4309	14
	5569	14
	6046	14
	6974	8
	8224	12
S(p)+3266.2	3695	14
	3940	6
	4319	7
	5579	6
	6056	5
	6984	13
	8234	43
	8259	33
S(p)+3350.6	6138	17
	7066	17

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

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

E_i(level)	E_γ	I_γ[†]
	8316	15
S(p)+3351.2	5662	8
	6139	9
	7067	15
	7415	60
	8317	8

Continued on next page (footnotes at end of table)

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05 (continued)

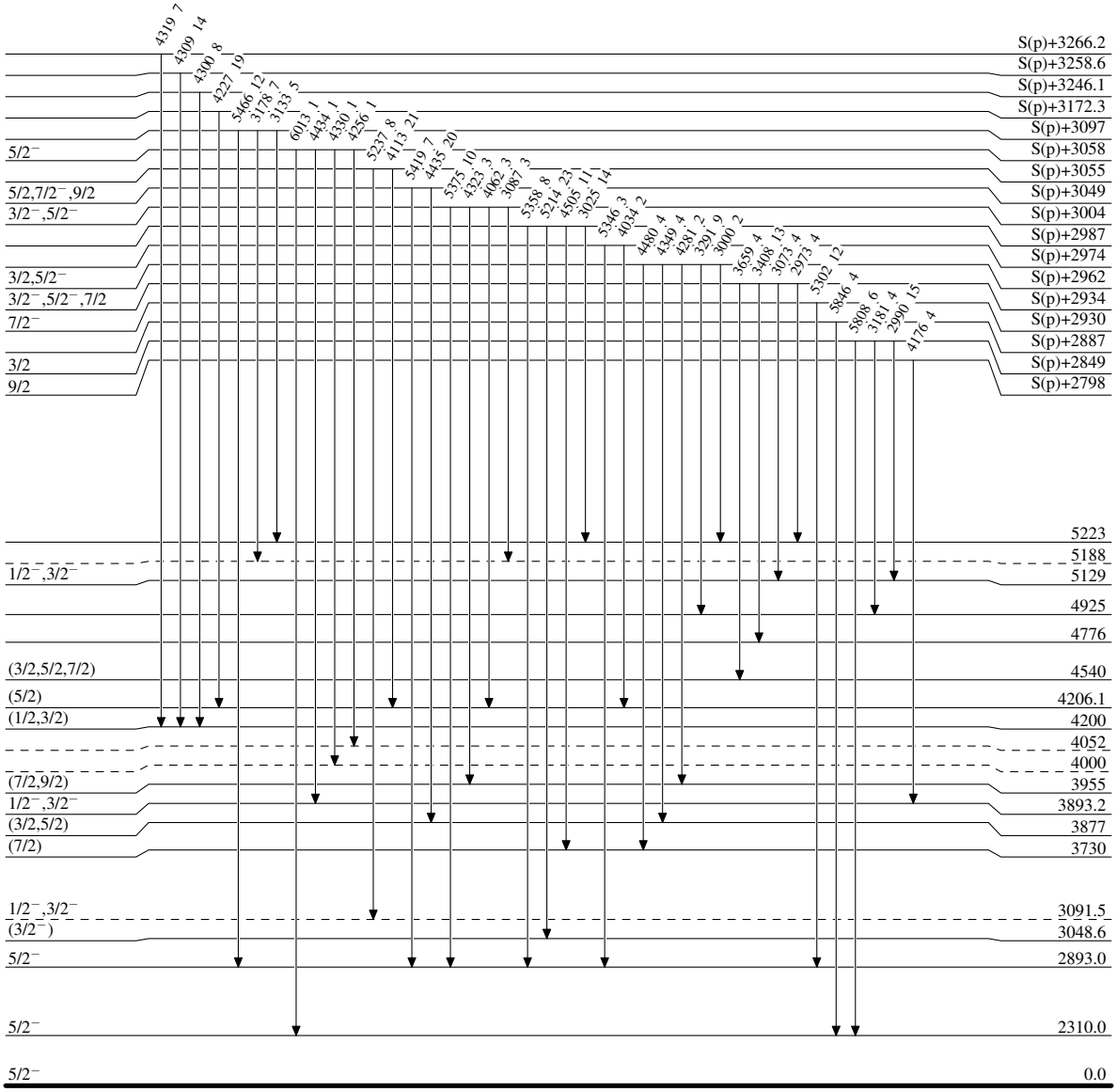
$\gamma(^{51}Mn)$ (continued)

† % photon branching from each level.
‡ From 1986Di01.
# From 1977No01.
@ The variation in branchings reported by 1986Di01, 1975Di10, and 1972Fo25 suggests that the 3049 level may be a doublet. Values are Iγ(773γ):Iγ(793γ):Iγ(1232γ):Iγ(1909γ):Iγ(2812γ)=−:-:26:28:46 (1986Di01), 15:45:40:-:- (1975Di10), and 13 *2*:33 *4*:-:-:25 *3* (1972Fo25). 1972Fo25 report 29% branching as unassigned.
& From 1972Fo25.
a From 1974Sc17.
b From 1975Di10.
c From 1988Ca05.
d From 1967Er05.
e From $\gamma(\theta)$ measurements for primary γ-rays (1986Di01,1972Fo25), except as noted.
f Based on the J^{π} values of known levels, Γ_{γ} and comparsion to RUL.
g Multiply placed.
h Multiply placed with intensity suitably divided.
i Placement of transition in the level scheme is uncertain.

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05

Level Scheme

Intensities: % photon branching from each level

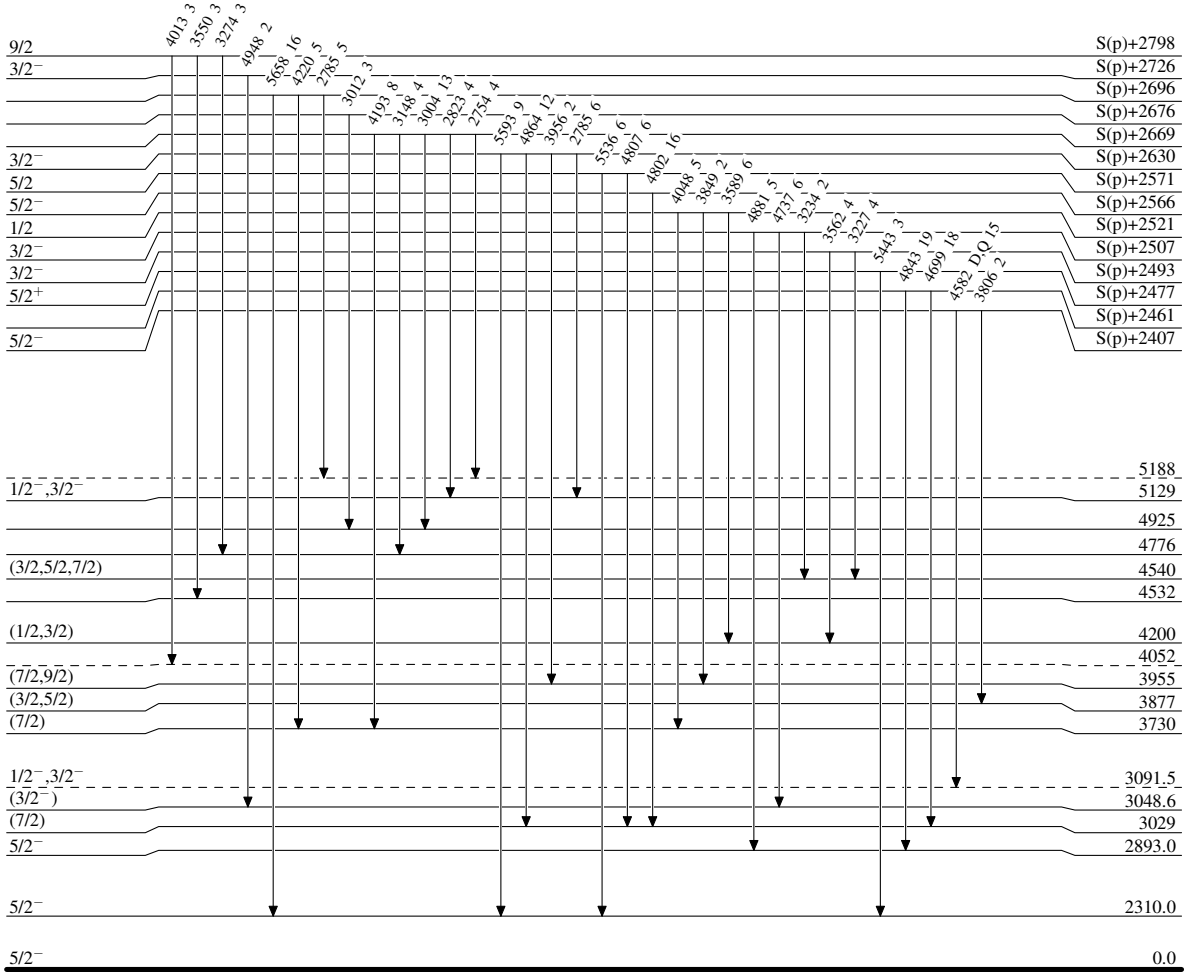


$^{51}_{25}Mn_{26}$

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05

Level Scheme (continued)

Intensities: % photon branching from each level

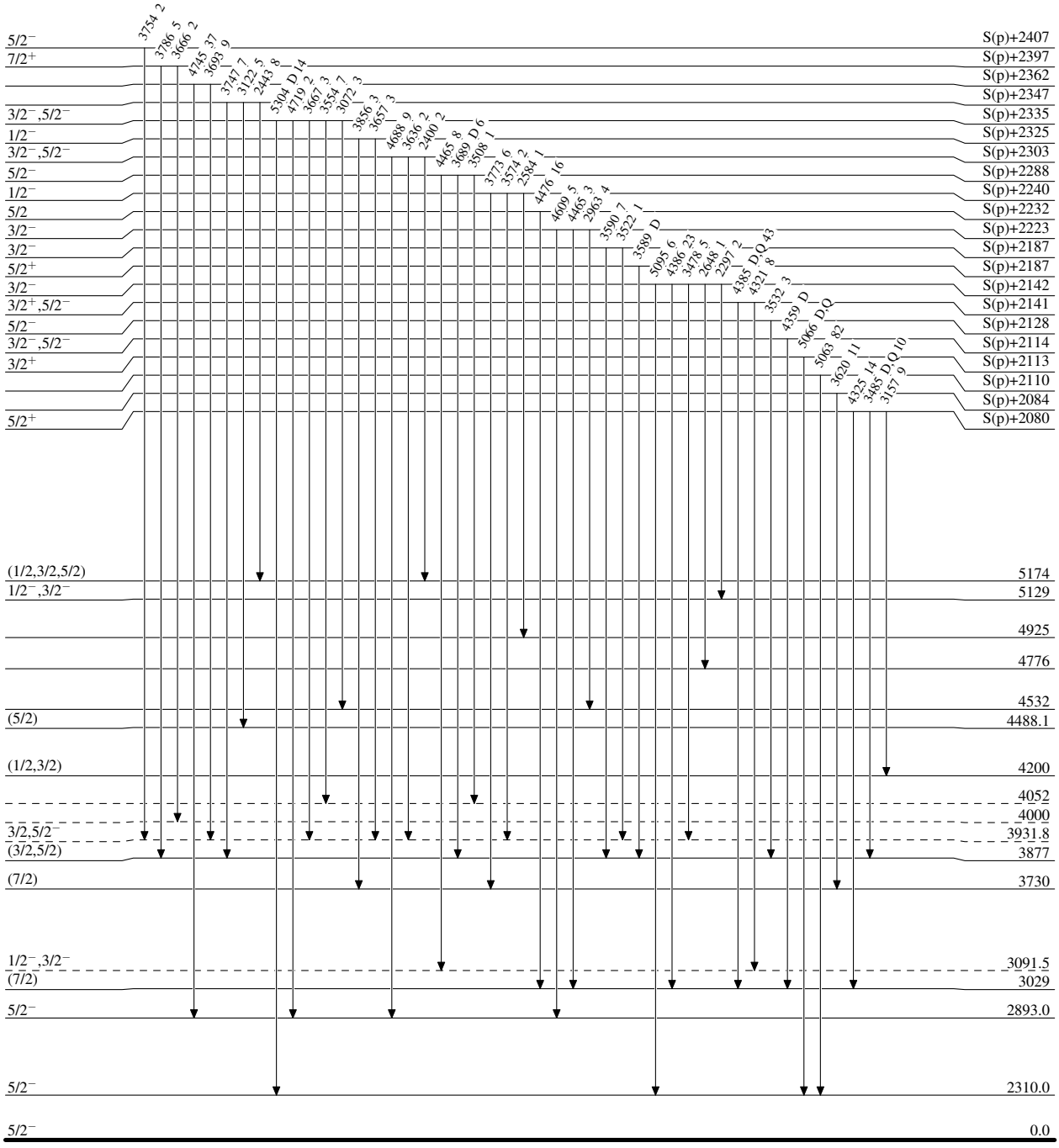


$^{51}_{25}Mn_{26}$

^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05

Level Scheme (continued)

Intensities: % photon branching from each level



$^{51}_{25}Mn_{26}$

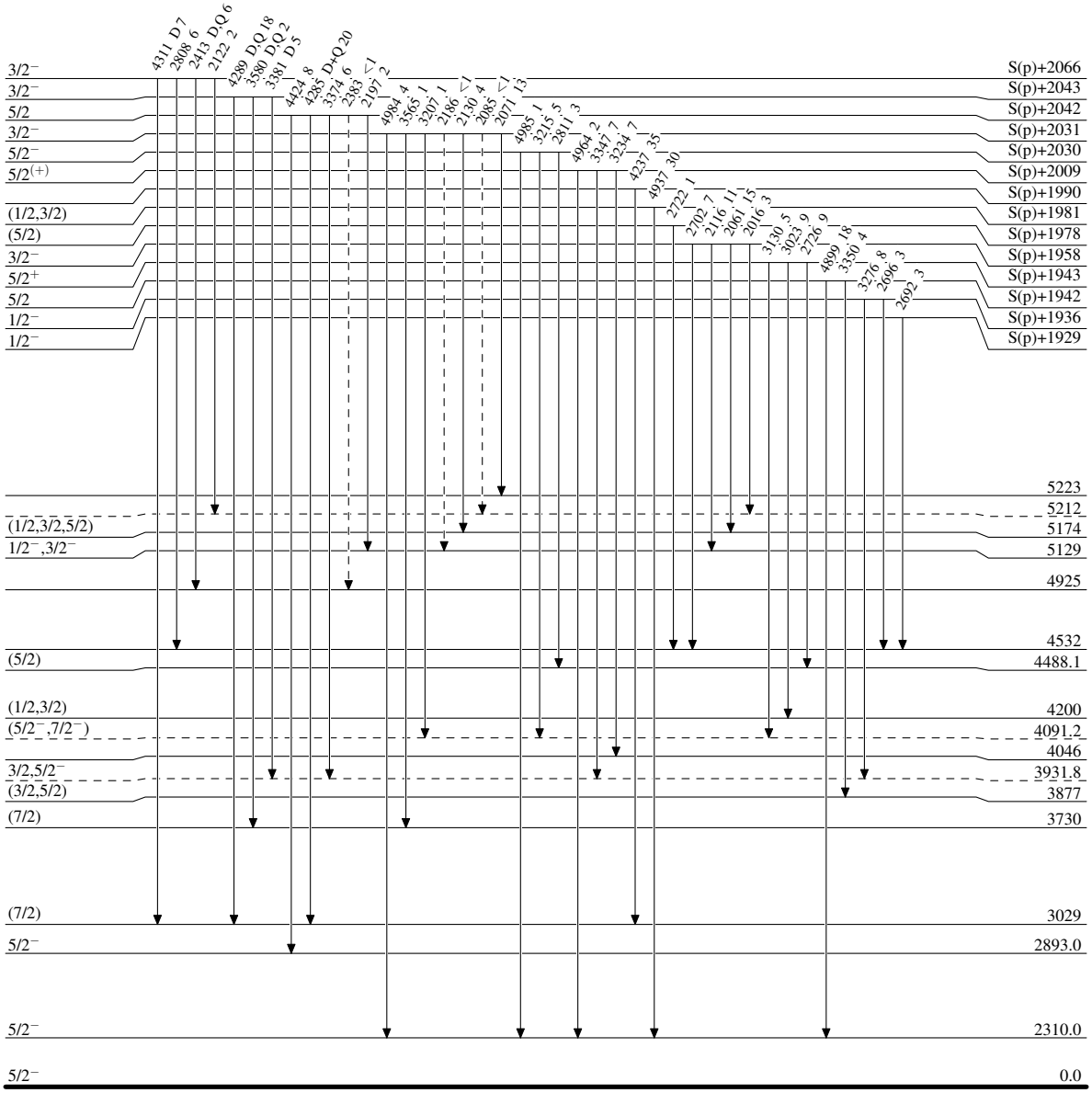
^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{51}_{25}Mn_{26}$

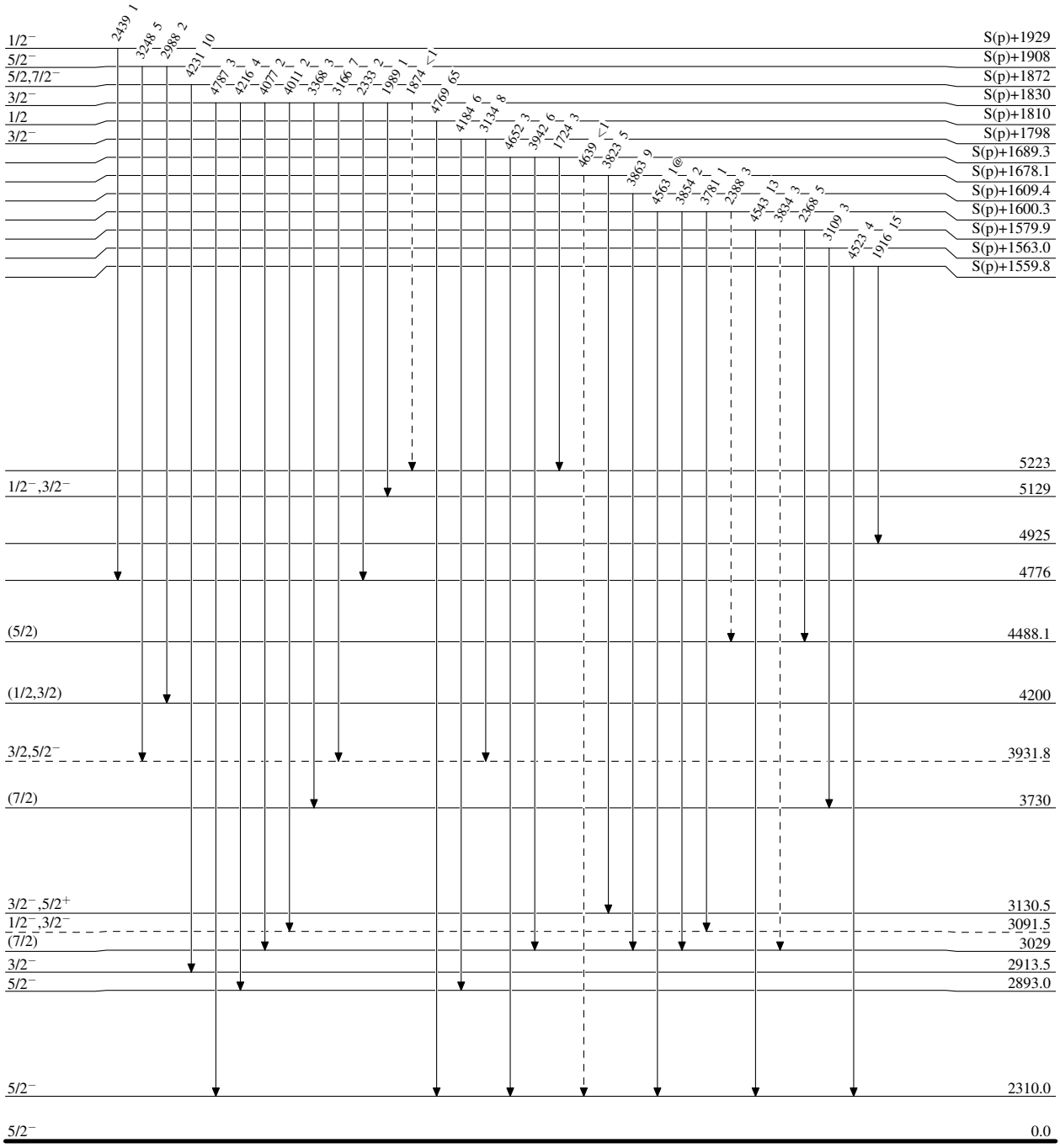
^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05

Legend

Level Scheme (continued)

Intensities: % photon branching from each level
@ Multiply placed: intensity suitably divided

γ Decay (Uncertain)



$^{51}_{25}Mn_{26}$

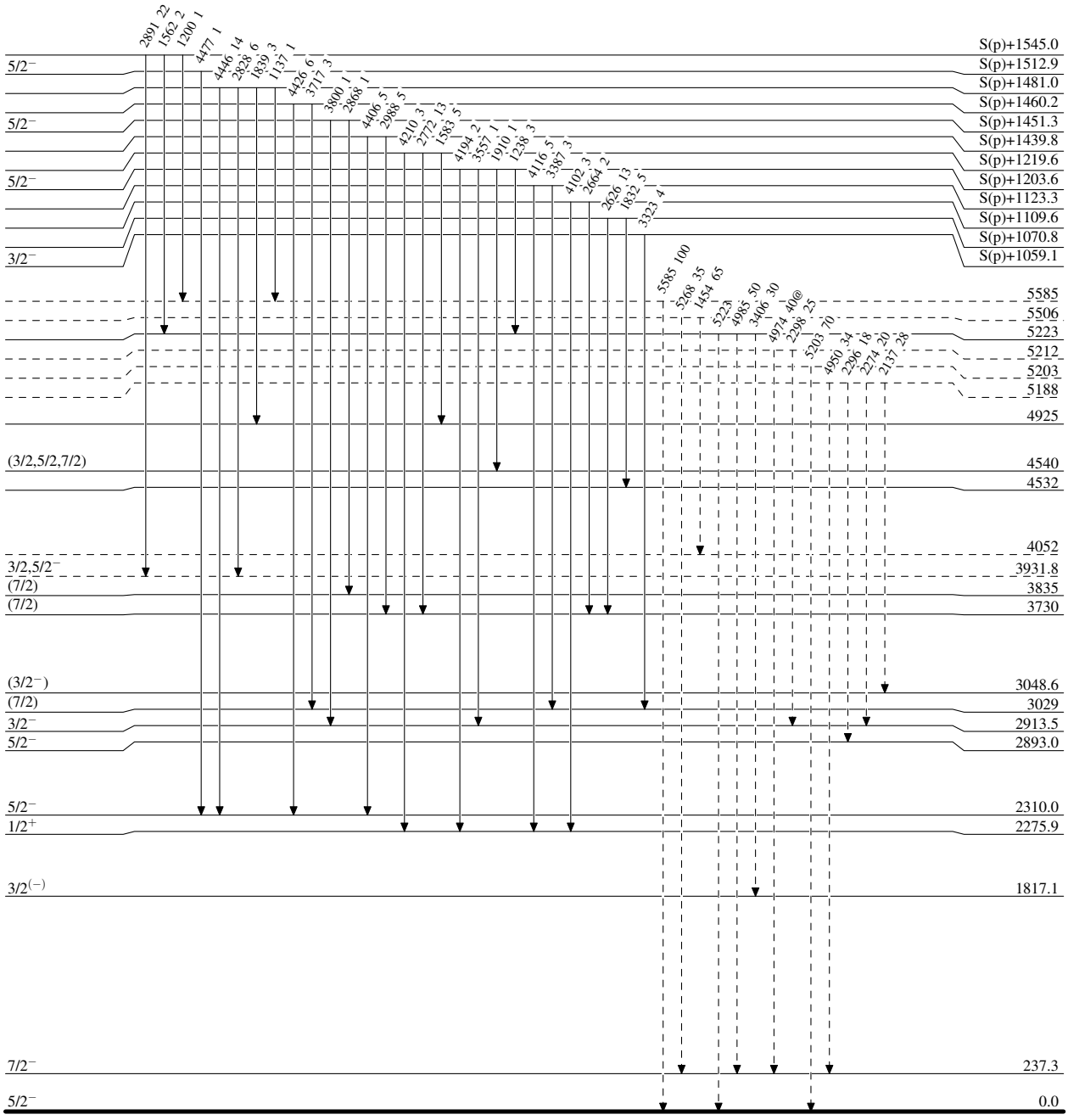
^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05

Legend

Level Scheme (continued)

Intensities: % photon branching from each level
@ Multiply placed: intensity suitably divided

- - - - - - ► γ Decay (Uncertain)



$^{51}_{25}Mn_{26}$

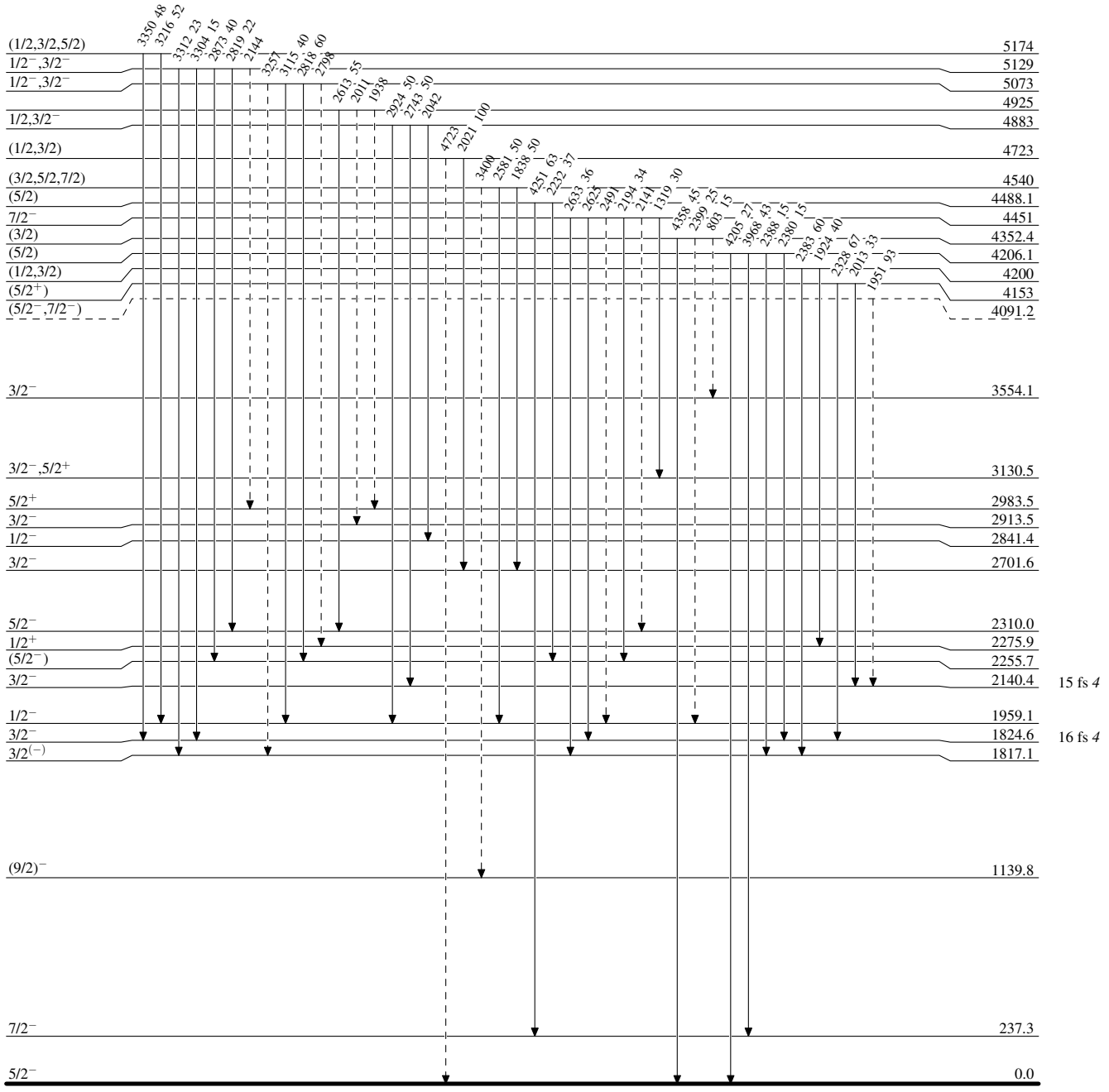
^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05

Legend

Level Scheme (continued)

Intensities: % photon branching from each level
@ Multiply placed: intensity suitably divided

γ Decay (Uncertain)



$^{51}_{25}Mn_{26}$

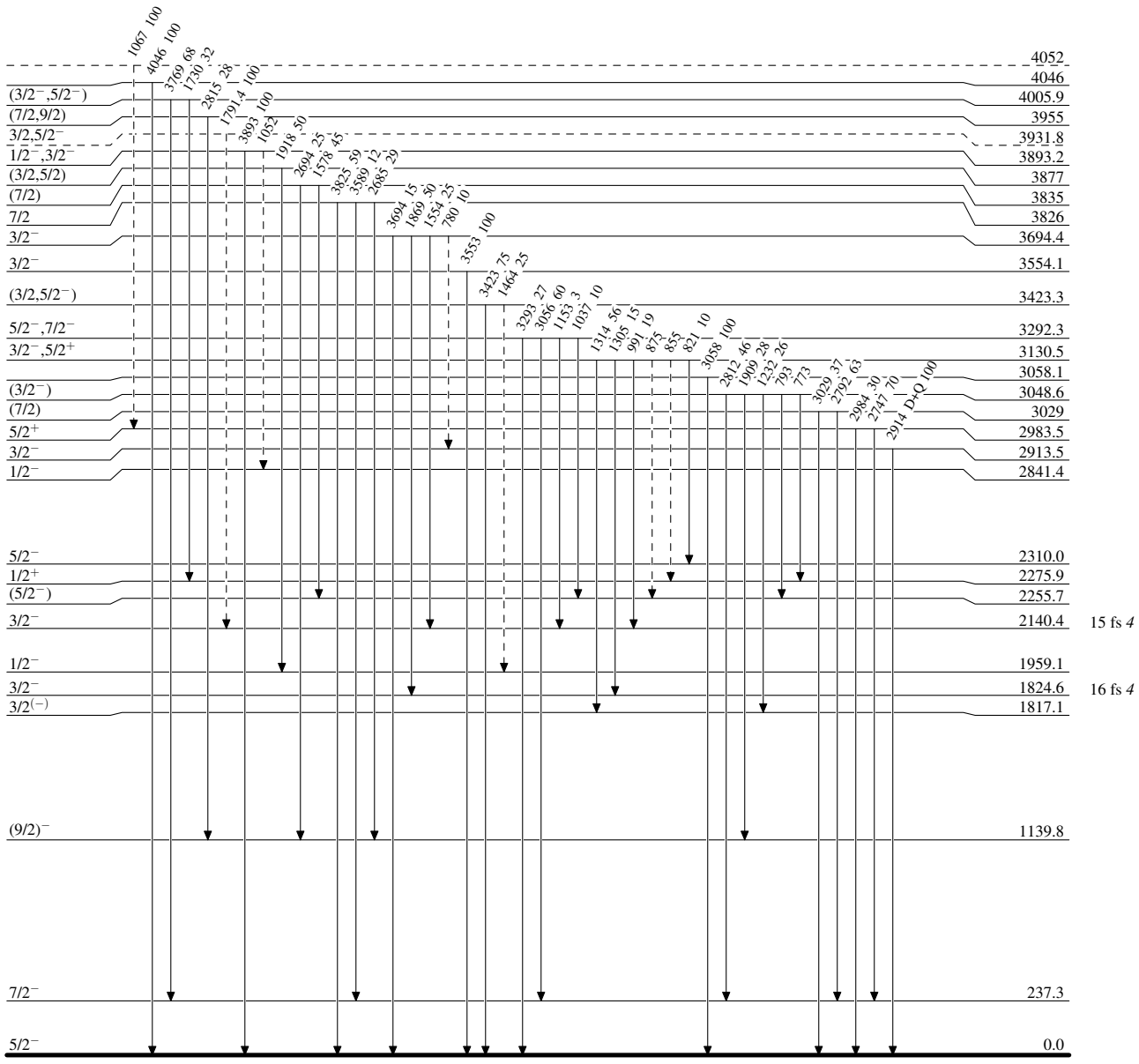
^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05

Legend

Level Scheme (continued)

Intensities: % photon branching from each level
@ Multiply placed: intensity suitably divided

γ Decay (Uncertain)



$^{51}_{25}Mn_{26}$

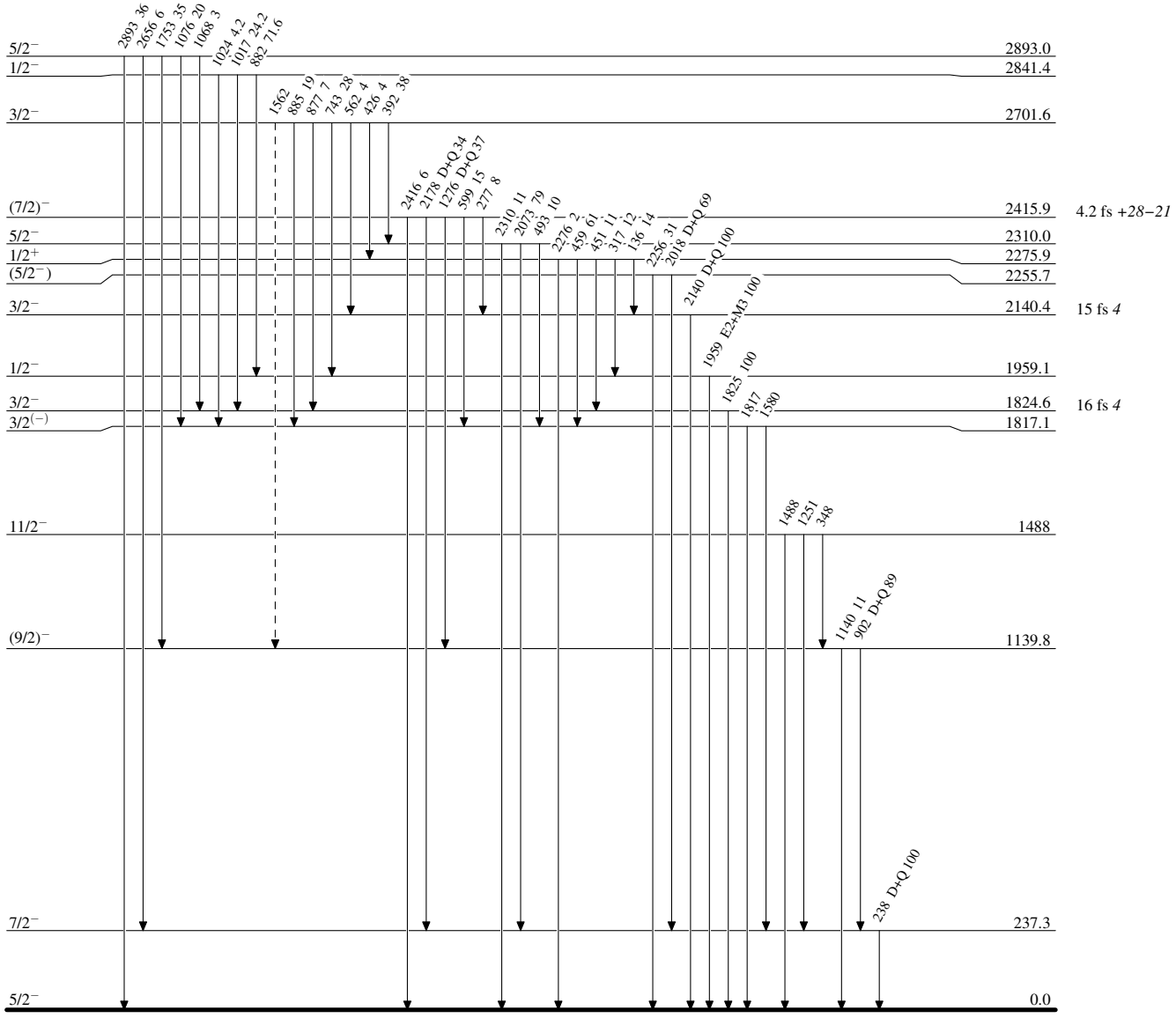
^{50}Cr(p,γ) 1972Fo25,1986Di01,1988Ca05

Legend

Level Scheme (continued)

Intensities: % photon branching from each level
@ Multiply placed: intensity suitably divided

– – – – – – ► γ Decay (Uncertain)



$^{51}_{25}Mn_{26}$