Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia[#], A. Chakraborty[##]	NDS 171, 1 (2021)	1-Jun-2020

Q(β^-)=−12221.6 *4*; S(n)=13144.9 *4*; S(p)=7580.97 *23*; Q(α)=−9650.48 *23* 2017Wa10
Other reaction: ^{20}Ne(^{3}He,γ): 1983Wa05 (E=3-19 MeV).

^{23}Mg Levels

Cross Reference (XREF) Flags

A	^{23}Al ε decay	F	^{12}C(^{16}O,αnγ)	K	^{24}Mg(d,t)
B	^{24}Si εp decay	G	^{22}Na(p,γ)	L	^{24}Mg(^{3}He,α)
C	^{1}H(^{22}Na,p):res	H	^{22}Na(^{3}He,d)	M	^{24}Mg(^{3}He,$\alpha\gamma$)
D	^{9}Be(^{22}Mg,^{23}Mgγ)	I	^{23}Na(^{3}He,t)	N	^{25}Mg(p,t)
E	^{12}C(^{12}C,nγ)	J	^{24}Mg(p,d),(pol p,d)		

E(level)[†]	J$^\pi$	T$_{1/2}$[b]	XREF	Comments
0.0[d]	3/2$^+$	11.3046 s *45*	AB DEFG IJKLMN	%ε+%β^+=100 μ=−0.5366 *3*; Q=0.114 *3* δ<r^2>(^{26}Mg,^{23}Mg)=+0.053 fm^2 *6* (stat) *34* (syst) (2012Yo01). <r^2>$^{1/2}$=3.0428 fm *10* (stat) *61* (syst) (2012Yo01). Also <r^2>$^{1/2}$=2.96 fm *14* and 3.00 fm *19* (1998Su07). J$^\pi$: L=2 (pol p,d) and vector analyzing power ((p,d),(pol p,d) − 1986Mi01). T$_{1/2}$: Weighted average of 11.3027 s *33* (2017Ma18), 11.317 s *11* (1977Az01 − revised value 11.327 s *14* (1975Az01)), 11.41 s *5* (1968Go10), 11.36 s *4* (1974Al03), and 11.26 s *8* (1974Az01). Other: 12.1 s *1* (1958Mi85). μ: From 2017Yo05, 2019StZV − collinear laser spectroscopy. Other: 0.5364 *3* (βNMR − 1993Fu06). Q: From 1999Mb13, 2016St14 − βNMR. Other: 0.125 *5* (1996MaZV).
450.70[d] *15*	5/2$^+$&	1.15 ps *8*	AB DEFG IJKLMN	J$^\pi$: L=2 in (p,d) and vector analyzing power ((p,d),(pol p,d) − 1986Mi01). T$_{1/2}$: From τ=1.66 ps *12*: Wt. ave. of τ=1.57 ps *12* (1990Ti02) and 2.00 ps 24 (1973Wa26) − both in (^{12}C,nγ), τ=1.65 ps *25* (^{3}He,$\alpha\gamma$), and 3.6 ps *+91−24* (1971It02 − DSA).
2051.6[d] *4*	7/2$^+$	65[c] fs *12*	A DEFG JKLMN	J$^\pi$: L=4 and vector analyzing power in (^{3}He,α). T$_{1/2}$: Other: 21 fs *14* from τ=30 fs *20*, tabulated in earlier evaluations 1998En04 and 1990En08 by P.M. Endt − source missing.
2357.0 *7*	1/2$^+$	575[c] fs *118*	AB DE IJKLMN	J$^\pi$: L=0 in (p,d).
2714.5[d] *5*	9/2$^+$	65 fs *8*	DEFG KLMN	J$^\pi$: 9/2,5/2 proposed by 1970Ha02 (^{3}He,$\alpha\gamma$) from angular correlation studies of 2263γ. L=4 in (p,t) from 5/2$^+$. 9/2$^+$ in (^{22}Mg,^{23}Mgγ) from measurements and CCBA calculations. Band assignment. T$_{1/2}$: From τ=94 fs *12*: Wt. ave. of τ=91 fs *12* (1990Ti02) and 80 fs *20* (1973Wa26) − both in (^{12}C,nγ), and τ=140 fs *30* (^{3}He,$\alpha\gamma$).
2771.2[e] *7*	1/2$^-$	75[c] fs *10*	E JKLMN	J$^\pi$: L=1 and vector analyzing power in (p,d),(pol p,d).
2905.2 *7*	(3/2)$^+$	10.4[c] fs *21*	DE I LMN	J$^\pi$: L=2 in (pol p,d) and vector analyzing power (poorly resolved).
3794.1 *4*	3/2$^-$	28.4[c] fs *42*	E JKLMN	J$^\pi$: L=1 and vector analyzing power in (p,d),(pol p,d).
3860.6 *7*	3/2$^+$,5/2$^+$	8.3 fs *21*	E I KL N	J$^\pi$: L=2 in (^{3}He,α) and γ to 7/2$^+$.

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Adopted Levels, Gammas (continued)

^{23}Mg Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[b]	XREF	Comments
3971.7[e] *6*	5/2⁻	<14 ns	E JKLMN	Jπ: L=3 in (p,t) and 5/2 from correlation studies in (^{3}He,α) 1970Ha02. $T_{1/2}$: Upper limit estimated from the coincidence resolving time in (^{3}He,αγ) measurements (1970Ha02).
4356.4 *20*	1/2⁺	<7.6[c] fs	IJKLMN	E(level): From (^{3}He,αγ). Jπ: L=0 in (p,d).
4681.5 *7*	(7/2)⁺	6.9 fs *21*	E JKL N	Jπ: M1+E2 to 9/2⁺ and 5/2⁺. L=2 in (p,t).
5287.5 *8*	3/2⁺,5/2⁺	3.5 fs *14*	E IJKLMN	Jπ: L=2 in (p,d). $T_{1/2}$: Other: <9.7 fs (^{3}He,αγ).
5453.7[d] *6*	(11/2)⁺	<10.4[c] fs	EF JKLMN	Jπ: L≥4 in (p,t) from 5/2⁺ target implies ≥3/2⁺; E2 γ to 7/2⁺.
5658[@] *4*	5/2⁺		I L N	Jπ: L=0 in (p,t).
5690.7 *6*	(1/2 to 9/2)⁺		E J L N	Jπ: L=2 in (p,t).
5712[@] *8*	1/2⁺,3/2⁺,5/2⁺		I L N	Jπ: L=0 in (^{3}He,t) from 3/2⁺ target.
5937.9 *7*	(11/2⁺)		EF L N	Jπ: D+Q γ to 9/2⁺. Based on decay scheme and yrast/yrare band structure (^{16}O,αnγ).
5992.8 *9*	1/2⁻,3/2⁻		E J L N	Jπ: L=1 in (p,d).
6129.3 *7*	(7/2⁻)	12.5 fs *21*	E I L N	XREF: I(6138). Jπ: 5677γ (E1) to 5/2⁺, 2158γ (M1+E2) to 5/2⁻.
6132.3 *13*	3/2⁺,5/2⁺		E J	XREF: J(6144). Jπ: L=2 in (p,d).
6194.7[d] *7*	(13/2⁺)	11.9 fs *21*	EF L N	Jπ: 3480γ E2 to 9/2⁺, 740γ M1+E2 to (11/2)⁺.
6240.0 *11*	(9/2)⁺	<27.7[c] fs	E H LMN	Jπ: 4188γ D+Q to 7/2⁺. L=2 in (p,t).
6246 *4*			J	
6372.5 *10*	(7/2⁺)		E H LMN	Jπ: 5921γ D+Q to 5/2⁺.
6377.0 *11*	(7/2⁺)	<31.2[c] fs	E	Jπ: 4325γ to 7/2⁺.
6391 *2*	(3/2⁺,5/2⁺)		J	Jπ: L=2 in (p,d).
6447.5 *12*	(9/2⁻)		E L N	Jπ: 1766γ to (7/2⁺).
6449.8[e] *6*	(9/2⁻)	24.3 fs *55*	E	Jπ: E1 to 7/2⁺, E2 to 5/2⁻, band assignment.
6513.6 *10*	(7/2)⁺		E H L N	Jπ: L=2 in (p,t), L=2+0 in (^{3}He,d) from 3⁺, 6062γ D+Q to 5/2⁺.
6540 *3*	3/2⁺,5/2⁺		HIJ L N	E(level): Unweighted average of data from (p,d), (p,t), (^{3}He,α), (^{3}He,t), and (^{3}He,d). Jπ: L=2 in (p,d). Other: L=0 in (^{3}He,t) from 3/2⁺ target.
6574.6 *10*	5/2⁺		E H L N	Jπ: L=0 in (p,t).
6775.4 *13*			E L N	
6803.9 *12*	3/2⁺,5/2⁺		E J l N	Jπ: L=2 in (p,d). 5/2⁻ in (^{12}C,nγ).
6804.6 *10*			E l N	Jπ: (7/2⁺) in (^{12}C,nγ).
6818 *3*	1/2⁺,3/2⁺,5/2⁺		I l	Jπ: L=0 in (^{3}He,t) from 3/2⁺ target.
6908 *3*	5/2⁺	<6.9[c] fs	HIJ LMN	E(level): From (^{3}He,αγ). Jπ: L=0 in (p,t).
6984 *5*	5/2⁺		H L N	E(level): Weighted average of data from (p,t), (^{3}He,α), and (^{3}He,d). Jπ: L=0 in (p,t).
7007 *5*	(3/2⁺,5/2⁺)		J	Jπ: L=2 in (p,d).
7021.5 *8*	(9/2)⁺		E H L N	Jπ: L=2 in (p,t), 4969γ D+Q to 7/2⁺.
7111.7 *10*	(3/2 to 11/2)⁺		E HI L N	Jπ: L=0+2 in (^{3}He,d) from 3⁺ target; L=4 in (p,t) from 5/2⁺ target. (7/2⁺) in (^{12}C,nγ).
7145.2 *7*	(13/2⁺)		EF l	Jπ: γ to 9/2⁺ and (11/2)⁺ and (13/2⁺) states.
7149.0 *8*	(5/2⁺)		E J l N	XREF: J(7144). Jπ: From L=2 in (p,d); L=0+2 in (p,t) from 5/2⁺ target implies (5/2)⁺; γ to 7/2⁺ and 9/2⁺ ((9/2⁺) in (^{12}C,nγ)).
7228.5 *13*			E L N	
7260 *6*	(3/2⁺,5/2⁺)		J	Jπ: L=2 in (p,d).
7261.9 *9*	(11/2⁺)	1.4 fs *7*	E H L N	Jπ: 4547γ M1+E2 to 9/2⁺.

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Adopted Levels, Gammas (continued)

^{23}Mg Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[b]	XREF	Comments
				$T_{1/2}$: From τ=2 fs *1* (2013Je04 – (^{12}C,nγ)).
7382.8 *10*	(7/2$^+$)		E N	Jπ: 6931γ D+Q to 5/2$^+$.
7450.5 *8*	(9/2)$^+$	<9.7[c] fs	E IJ MN	Jπ: 5399γ D+Q to 7/2$^+$, 6998γ Q to 5/2$^+$. L=2 in (p,t).
7497.2 *11*	(9/2)$^+$	<13.9[c] fs	E H MN	Jπ: L=2 in (p,t), 5445γ to (9/2$^+$).
7583 *6*	5/2$^+$[&]		H J L N	E(level): Weighted average of data from (p,t), (^{3}He,d), and (p,d),(pol p,d). Jπ: L=0 in (p,t).
7624.4 *9*	(9/2)$^+$	2.8 fs *14*	E H J N	Jπ: L=4 in (p,d), L=2 in (p,t), E2 γ to 5/2$^+$.
7648 *3*	3/2$^+$,5/2$^+$		E H J L	XREF: H(7641)L(7635). Jπ: L=2 in (p,d).
7770.4 *6*		1.4 fs *7*	E L	Jπ: (9/2$^-$) in (^{12}C,nγ). L=3 (preliminary) in (^{3}He,α) yields 5/2$^-$,7/2$^-$.
7781.8 *9*	(11/2$^+$)	<0.7 fs	E H	Jπ: E2 to 7/2$^+$, γ to 9/2$^+$.
7784.7 *8*	3/2$^+$,5/2$^+$	6.9 fs *21*	A E G J MN	Jπ: L=2 in (p,d), 7333γ M1+E2 to 5/2$^+$. L=4 in (p,t), 7/2$^{(+)}$ in (^{12}C,nγ). $T_{1/2}$: Other: <8.3 fs (^{3}He,$\alpha\gamma$).
7803.0 *6*	5/2$^+$		A HIJ L N	%p=0.17 *8* T=3/2 XREF: I(7790)L(7793). Jπ: L=0 in (p,t).
7855.5 *7*	(7/2$^+$)		A E GHIJ L N	%p<100 Jπ: L=4 (preliminary) in (^{3}He,α). log *ft*=5.2 from 5/2$^+$ in ^{23}Al ε decay.
7918 *15*			A	
8015.6 *7*	(5/2,7/2)		A E GH j L N	%p<100 Jπ: γ to 7/2$^+$ and 9/2$^+$; log *ft* 6.0 from 5/2$^+$ in the ^{23}Al ε decay. (5/2 to 11/2) in (^{12}C,nγ).
8044 *4*			J	
8062 *2*			GH L N	E(level): From (p,γ). Others: 8055 *10* (p,d),(pol p,d), 8058 *7* (p,t).
8074 *8*			A HIJ L N	E(level): Weighted average of data from (p,t), (^{3}He,d), (p,d)(pol p,d), (^{3}He,t), and ^{23}Al ε decay.
8141 *5*			J	
8163.1 *12*	5/2$^+$		A E G IJ L N	%p<100 Jπ: L=0 in (p,t).
8193 *8*			J N	E(level): From (p,t). Other: 8197 *5* (p,d) (estimated uncertainty by evaluators).
8288 *3*			A G N	E(level): From (p,γ).
8330 *6*	3/2$^+$,5/2$^+$		J	Jπ: L=2 in (p,d).
8342 *2*			G	
8393 *6*			N	
8427[‡] *8*			J N	E(level): Wt. ave. of data from (p,d) and (p,t).
8449[#] *2*	3/2$^+$,5/2$^+$		A I N	%p=100 Additional information 1. Jπ: L=0 in (^{3}He,t) from 3/2$^+$ target. log *ft*=4.4 from 5/2$^+$ in ^{23}Al ε decay.
8557 *6*			N	
8578 *2*	3/2,5/2,7/2		A	Jπ: log *ft*=6.1 from 5/2$^+$ in ^{23}Al ε decay.
8617[‡] *6*	(5/2,7/2,9/2)$^-$[a]		C J N	
8762 *6*			J N	XREF: J(8770). E(level): Wt. ave. of data from (p,d) and (p,t).
8793[‡] *8*	(7/2$^+$)[a]		A C N	XREF: A(8781).
8840 *3*	3/2,5/2,7/2		A	Jπ: log *ft*=6.0 from 5/2$^+$ in ^{23}Al ε decay.
8870 *8*			N	

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Adopted Levels, Gammas (continued)

^{23}Mg Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$[b]	XREF	Comments
8908 *3*	(5/2+)[a]		A C N	E(level): Weighted average of data from (p,t), ^{23}Al ε decay, (p,d),(pol p,d), and ^{1}H(^{22}Na,p):res.
8924 *5*	1/2−,3/2−		J	Jπ: L=1 in (p,d).
8941.6 *10*		<70 fs	EF N	%p<100
8993[#] *6*	3/2+,5/2+,7/2+		A N	Jπ: L=2 in (p,t). log *ft*=5.3 from 5/2+ in ^{23}Al ε decay.
9020 *30*	1/2−,3/2−		J	Jπ: L=1 in (p,d).
9022[#] *4*	3/2,5/2,7/2		A N	Jπ: log *ft*=6.1 from 5/2+ in ^{23}Al ε decay.
9060 *8*			N	
9102[#] *6*	3/2,5/2,7/2		A N	Jπ: log *ft*=6.0 from 5/2+ in ^{23}Al ε decay.
9135 *6*	3/2,5/2,7/2		A J N	E(level): Unweighted average of data from (p,t), ^{23}Al ε decay, and (p,d),(pol p,d). Jπ: log *ft*=5.0 from 5/2+ in ^{23}Al ε decay.
9159 *6*	1/2+,3/2+,5/2+		I	Jπ: L=0 in (^{3}He,t) from 3/2+ target.
9253 *8*			N	
9325 *5*	3/2,5/2,7/2		A J N	E(level): Weighted average of data from (p,t), ^{23}Al ε decay, and (p,d),(pol p,d). Jπ: log *ft*=5.0 from 5/2+ in ^{23}Al ε decay.
9374 *8*			N	
9403 *8*			N	
9421[‡] *4*	3/2+,5/2+,7/2+		A N	Jπ: log *ft*=4.5 from 5/2+ in ^{23}Al ε decay.
9468 *5*	3/2+,5/2+,7/2+		A J N	E(level): Weighted average of data from (p,t), ^{23}Al ε decay, and (p,d),(pol p,d). Jπ: L=2 in (p,t). log *ft*=5.2 from 5/2+ in ^{23}Al ε decay.
9502 *6*	1/2+,3/2+,5/2+		I	Jπ: L=0 from 3/2+ in (^{3}He,t).
9596.7 *10*	(15/2+,17/2+)	<70 fs	EF N	Jπ: 15/2+ in (^{16}O,αnγ) and (17/2+) in (^{12}C,n). γ to (13/2+).
9604 *5*	3/2,5/2,7/2		A	%p=100 Jπ: log *ft*=5.6 from 5/2+ in ^{23}Al ε decay.
9642 *8*			J N	
9673[#] *7*	3/2−		A J N	E(level): Wt. ave. of data from ^{23}Al ε decay, (p,t) and (p,d). Jπ: L=1 in (p,d) and log *ft*=6.0 from 5/2+ in ^{23}Al ε decay.
9717 *8*			N	
9750 *50*			J	
9850 *30*	(3/2+,5/2+)		J	Jπ: L=(2) in (p,d).
9970 *40*	(1/2−,3/2−)		J	Jπ: L=(1) in (p,d).
10120 *50*			J	
10270 *30*	(1/2−,3/2−)		J	Jπ: L=(1) in (p,d).
10290 *7*	1/2+,3/2+,5/2+		I	Jπ: L=0 in (^{3}He,t) from 3/2+ target.
10440 *50*	(1/2−,3/2−)		J	Jπ: L=(1) in (p,d).
10570 *20*	1/2−,3/2−		J	Jπ: L=1 in (p,d).
10750 *40*	(3/2+,5/2+)		J	Jπ: L=(2) in (p,d).
10920 *70*			J	
11030 *60*			E J	
11132 *8*	1/2+,3/2+,5/2+		I	Jπ: L=0 in (^{3}He,t) from 3/2+ target.
11210 *60*			E J	
11380 *60*			J	
11540 *60*			E J	
11800 *40*			E J	XREF: E(11760).
11990 *50*			J	
12480 *80*			J	
12690 *80*			J	
12940 *80*			J	
13280 *80*			J	
14130 *20*			E	%p=100 Additional information 2.

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Adopted Levels, Gammas (continued)

^{23}Mg Levels (continued)

E(level)[†]	XREF	Comments
14560 *20*	E	%p=100 Additional information 3.

[†] From least squares fit to γ-ray energies (measured and reported), assuming $\Delta E=1$ keV for γ rays without uncertainty. Calculated Eγ from level energy differences were deduced after the fit and marked by footnote.
[‡] From (p,t).
[#] Weighted average of data from ^{23}Al ε decay and (p,t).
[@] From (^{3}He,t).
[&] From vector analyzing power in (pol p,d) (1986Mi01).
[a] Proposed by 2013Ji13 – ^{1}H(^{22}Na,p):res, based on R-matrix analysis of measured excitation function.
[b] From ((^{12}C,nγ) – by DSA method), except otherwise noted.
[c] From (^{3}He,$\alpha\gamma$) by DSA method.
[d] Band(A): π+ band.
[e] Band(B): $K^{\pi}=(1/2^{-})$ band.

Adopted Levels, Gammas (continued)

γ(^{23}Mg)

E_i(level)	J_i^π	E_γ	I_γ[c]	E_f	J_f^π	Mult.[d]	δ[e]	α[f]	Comments
450.70	5/2$^+$	450.70‡ *15*	100	0.0	3/2$^+$	M1+E2	−0.06 *2*		B(M1)(W.u.)=0.209 *15*; B(E2)(W.u.)=24 *+20−13*
2051.6	7/2$^+$	1601.4@ *13*	100.0@ *24*	450.70	5/2$^+$	M1+E2	−0.19 *2*	1.02×10^{-4} *2*	α(K)=5.65×10^{-6} *8*; α(L)=3.63×10^{-7} *6*; α(M)=1.344×10^{-8} *19* α(IPF)=9.57×10^{-5} *15* B(M1)(W.u.)=0.070 *+16−11*; B(E2)(W.u.)=6.5 *+21−16*
		2051.5[b]	13.9 *11*	0.0	3/2$^+$	E2(+M3)	+0.05 *5*	3.43×10^{-4} *6*	α(K)=4.21×10^{-6} *8*; α(L)=2.70×10^{-7} *5*; α(M)=1.002×10^{-8} *18* α(IPF)=0.000338 *6* B(E2)(W.u.)=7.5 *+18−13* I_γ: Unweighted average of data from (^{12}C,nγ) and (^{3}He,αγ).
2357.0	1/2$^+$	1906‡ *1*	100@ *4*	450.70	5/2$^+$	[E2]		2.74×10^{-4}	B(E2)(W.u.)=6.9 *+18−12* α(K)=4.80×10^{-6} *7*; α(L)=3.08×10^{-7} *5*; α(M)=1.142×10^{-8} *16* α(IPF)=0.000268 *4*
		2357.9[b]	45@ *4*	0.0	3/2$^+$				
2714.5	9/2$^+$	662.04‡ *40*	42.3 *6*	2051.6	7/2$^+$				
		2263‡ *1*	100.0 *7*	450.70	5/2$^+$	[E2]			B(E2)(W.u.)=26.5 *+37−30*
2771.2	1/2$^-$	2769.7@ *12*	100	0.0	3/2$^+$	[E1]		1.13×10^{-3}	α(K)=1.721×10^{-6} *25*; α(L)=1.104×10^{-7} *16*; α(M)=4.09×10^{-9} *6* α(IPF)=0.001125 *16* B(E1)(W.u.)=5.2×10^{-4} *+8−6*
2905.2	(3/2)$^+$	2454.6[b]	59@ *3*	450.70	5/2$^+$	D+Q			I_γ: Other: 100 *4* (^{12}C,nγ).
		2906.4@ *11*	100@ *3*	0.0	3/2$^+$	D+Q			I_γ: Other: 66 *6* (^{12}C,nγ).
3794.1	3/2$^-$	1023‡ *1*	3.4 *8*	2771.2	1/2$^-$	M1			B(M1)(W.u.)=0.023 *6*
		3343.9@ *13*	100.0 *17*	450.70	5/2$^+$	E1		1.41×10^{-3}	α(K)=1.356×10^{-6} *19*; α(L)=8.70×10^{-8} *13*; α(M)=3.22×10^{-9} *5* α(IPF)=0.001405 *20* B(E1)(W.u.)=7.1×10^{-4} *+13−9*
		3794.1[b]	8.1@ *23*	0.0	3/2$^+$	E1+M2	<0.45	0.00152 *8*	α(K)=1.23×10^{-6} *8*; α(L)=7.9×10^{-8} *5*; α(M)=2.93×10^{-9} *18* α(IPF)=0.00152 *8* B(E1)(W.u.)=3.7×10^{-5} *+22−17*; B(M2)(W.u.)<3.0 δ: Based on the RUL(M2)=3 (upperlimit). Other: δ>0.4 in (^{3}He,αγ), the lowerlimit appears to be a typo.
3860.6	3/2$^+$,5/2$^+$	956‡ *1*		2905.2	(3/2)$^+$				

$^{23}_{12}Mg_{11}$-6

Adopted Levels, Gammas (continued)

γ(^{23}Mg) (continued)

E_i(level)	J_i^π	E_γ	I_γ[c]	E_f	J_f^π	Mult.[d]	α[f]	Comments
3860.6	3/2$^+$,5/2$^+$	1503‡ *1*	42 *8*	2357.0	1/2$^+$			
		1809‡ *1*	100 *17*	2051.6	7/2$^+$			
3971.7	5/2$^-$	178‡ *1*	8.9 *6*	3794.1	3/2$^-$			
		1067‡ *1*	1.9 *6*	2905.2	(3/2)$^+$			
		1200‡ *1*	3.8 *6*	2771.2	1/2$^-$			
		1920‡ *1*	100 *3*	2051.6	7/2$^+$	D‡		α(IPF)=0.000587 *9*
		3972[b]	80	0.0	3/2$^+$	D+Q		I_γ: From (^{3}He,αγ). δ: −4.33 *9* in 1970Ha02 note that large value implies E2(+M1) and consequently positive parity for the depopulating state. That would be inconsistent with negative parity from L=3 (p,t).
4356.4	1/2$^+$	1999[b]	4[@] *3*	2357.0	1/2$^+$			
		4356[b]	100[@] *3*	0.0	3/2$^+$			
4681.5	(7/2)$^+$	1967‡ *1*	17.4 *17*	2714.5	9/2$^+$	M1+E2‡	0.00027 *4*	α(K)=4.3×10^{-6} *3*; α(L)=2.74×10^{-7} *18*; α(M)=1.01×10^{-8} *7* α(IPF)=0.00026 *4*
		2630‡ *1*	47.8 *17*	2051.6	7/2$^+$			
		4230‡ *1*	100.0 *26*	450.70	5/2$^+$	M1+E2‡	0.00117 *8*	α(K)=1.31×10^{-6} *3*; α(L)=8.42×10^{-8} *18*; α(M)=3.12×10^{-9} *7* α(IPF)=0.00117 *8*
5287.5	3/2$^+$,5/2$^+$	3236‡ *1*	100 *11*	2051.6	7/2$^+$			
		4836‡ *1*	93 *4*	450.70	5/2$^+$			
5453.7	(11/2)$^+$	2739‡ *1*	100 *3*	2714.5	9/2$^+$	D+Q‡		
		3402‡ *1*	50 *3*	2051.6	7/2$^+$	E2‡		
5690.7	(1/2 to 9/2)$^+$	1830‡ *1*		3860.6	3/2$^+$,5/2$^+$			
		5240‡ *1*	32 *2*	450.70	5/2$^+$			
		5690‡ *1*	100 *7*	0.0	3/2$^+$			
5937.9	(11/2$^+$)	3223‡ *1*	100 *3*	2714.5	9/2$^+$	D+Q‡		
		3886‡ *1*	19 *2*	2051.6	7/2$^+$	‡		
5992.8	1/2$^-$,3/2$^-$	3221‡ *1*	21 *5*	2771.2	1/2$^-$			
		3636‡ *1*	100 *11*	2357.0	1/2$^+$			
6129.3	(7/2$^-$)	2158‡ *1*	48 *7*	3971.7	5/2$^-$	(M1+E2)‡	0.00035 *5*	α(K)=3.64×10^{-6} *20*; α(L)=2.34×10^{-7} *13*; α(M)=8.7×10^{-9} *5* α(IPF)=0.00035 *5*
		3415‡ *1*	100 *21*	2714.5	9/2$^+$	[E1]		B(E1)(W.u.)=9.3×10^{-4} *19*
		5677‡ *1*	35 *3*	450.70	5/2$^+$	(E1)‡	0.00221	α(K)=7.26×10^{-7} *11*; α(L)=4.66×10^{-8} *7*; α(M)=1.727×10^{-9} *25* α(IPF)=0.00221 *3* B(E1)(W.u.)=7.0×10^{-5} *+19−13*
6132.3	3/2$^+$,5/2$^+$	3775‡ *1*	100	2357.0	1/2$^+$			
6194.7	(13/2$^+$)	740‡ *1*	11.8 *6*	5453.7	(11/2)$^+$	M1+E2‡		

$^{23}_{12}Mg_{11}$-7

Adopted Levels, Gammas (continued)

γ(^{23}Mg) (continued)

E_i(level)	J_i^π	E_γ	I_γ[c]	E_f	J_f^π	Mult.[d]	α[f]	Comments
6194.7	(13/2$^+$)	3480‡ *1*	100.0 *18*	2714.5	9/2$^+$	E2‡	9.86×10^{-4}	α(K)=1.770×10^{-6} *25*; α(L)=1.136×10^{-7} *16*; α(M)=4.21×10^{-9} *6* α(IPF)=0.000984 *14* B(E2)(W.u.)=21.4 *+46−33*
6240.0	(9/2)$^+$	4188‡ *1*	100	2051.6	7/2$^+$	D+Q‡		
6372.5	(7/2$^+$)	5921‡ *1*	100	450.70	5/2$^+$	D+Q‡		
6377.0	(7/2$^+$)	4325‡ *1*	100	2051.6	7/2$^+$			
6447.5	(9/2$^-$)	1766‡ *1*		4681.5	(7/2)$^+$			
6449.8	(9/2$^-$)	996‡ *1*	10.8 *27*	5453.7	(11/2)$^+$	[E1]		B(E1)(W.u.)=0.0020 *6*
		2478‡ *1*	100.0 *27*	3971.7	5/2$^-$	E2‡	5.50×10^{-4}	α(K)=3.02×10^{-6} *5*; α(L)=1.94×10^{-7} *3*; α(M)=7.20×10^{-9} *10* α(IPF)=0.000547 *8* B(E2)(W.u.)=32 *+9−6*
		3735‡ *1*	16.2 *27*	2714.5	9/2$^+$	[E1]		B(E1)(W.u.)=5.4×10^{-5} *+18−13*
		4398‡ *1*	71.6 *27*	2051.6	7/2$^+$	(E1)‡	0.00183	α(K)=9.75×10^{-7} *14*; α(L)=6.25×10^{-8} *9*; α(M)=2.32×10^{-9} *4* α(IPF)=0.00183 *3* B(E1)(W.u.)=1.46×10^{-4} *+43−27*
6513.6	(7/2)$^+$	6062‡ *1*	100	450.70	5/2$^+$	D+Q‡		
6574.6	5/2$^+$	6123‡ *1*	100	450.70	5/2$^+$			
6775.4		4418‡ *1*	100	2357.0	1/2$^+$			
6803.9	3/2$^+$,5/2$^+$	2832‡ *1*	100	3971.7	5/2$^-$			
6804.6		6353‡ *1*	100	450.70	5/2$^+$			
7021.5	(9/2)$^+$	4307‡ *1*	100 *13*	2714.5	9/2$^+$			
		4969‡ *1*	67 *4*	2051.6	7/2$^+$	D+Q‡		
7111.7	(3/2 to 11/2)$^+$	6660‡ *1*	100	450.70	5/2$^+$			
7145.2	(13/2$^+$)	951‡ *1*	1.0 *3*	6194.7	(13/2$^+$)			
		1207‡ *1*	2.3 *3*	5937.9	(11/2$^+$)			
		1691‡ *1*	2.0 *3*	5453.7	(11/2)$^+$			
		4430‡ *1*	100 *10*	2714.5	9/2$^+$			I_γ: Assuming half of the 4430+4435 γ-ray doublet intensity.
7149.0	(5/2$^+$)	1459‡ *1*	3.0 *3*	5690.7	(1/2 to 9/2)$^+$			
		4435‡ *1*	100 *10*	2714.5	9/2$^+$			I_γ: Assuming half of the 4430+4435 γ-ray doublet intensity.
7228.5		4871‡ *1*	100	2357.0	1/2$^+$			
7261.9	(11/2$^+$)	1808‡ *1*	8.5 *21*	5453.7	(11/2)$^+$			
		4547‡ *1*	100.0 *21*	2714.5	9/2$^+$	M1+E2‡	0.00128 *8*	α(K)=1.189×10^{-6} *24*; α(L)=7.63×10^{-8} *16*;

Adopted Levels, Gammas (continued)

γ(^{23}Mg) (continued)

E_i(level)	J_i^π	E_γ	I_γ[c]	E_f	J_f^π	Mult.[d]	α[f]	Comments
								α(M)=2.83×10^{-9} *6* α(IPF)=0.00128 *8*
7382.8	(7/2$^+$)	6931‡ *1*	100	450.70	5/2$^+$	D+Q‡		
7450.5	(9/2)$^+$	5399‡ *1*	63 *6*	2051.6	7/2$^+$	D+Q‡		
		6998‡ *1*	100 *6*	450.70	5/2$^+$	E2‡		
7497.2	(9/2)$^+$	5445‡ *1*	100	2051.6	7/2$^+$			
7624.4	(9/2)$^+$	7172.5‡ *9*	100	450.70	5/2$^+$	E2‡		B(E2)(W.u.)=2.7 *+23−10*
7648	3/2$^+$,5/2$^+$	7196.0‡ *26*	100	450.70	5/2$^+$	D+Q‡		
7770.4		2316.9‡ *5*	73 *9*	5453.7	(11/2)$^+$			
		5054.8‡ *6*	100 *18*	2714.5	9/2$^+$			
7781.8	(11/2$^+$)	5067.1‡ *11*	100 *9*	2714.5	9/2$^+$			
		5729.1‡ *11*	50 *13*	2051.6	7/2$^+$	E2‡	1.68×10^{-3}	α(K)=8.83×10^{-7} *13*; α(L)=5.66×10^{-8} *8*; α(M)=2.10×10^{-9} *3* α(IPF)=0.001682 *24* B(E2)(W.u.)>8.5
7784.7	3/2$^+$,5/2$^+$	5732	16 *4*	2051.6	7/2$^+$			I_γ: Unweighted average of data from (p,γ) and ^{23}Al ε decay.
		7333.2# *11*	100& *6*	450.70	5/2$^+$	M1+E2‡		
7803.0	5/2$^+$	5751[a]	5.5[a] *21*	2051.6	7/2$^+$			
		7351[a]	45[a] *5*	450.70	5/2$^+$			
		7801.3[a]	100[a]	0.0	3/2$^+$			
7855.5	(7/2$^+$)	5139.7# *12*	100& *8*	2714.5	9/2$^+$			
		5803.2& *13*	26& *4*	2051.6	7/2$^+$			
		7403.6[b]	7& *3*	450.70	5/2$^+$			
8015.6	(5/2,7/2)	5300.1& *8*	100.0& *23*	2714.5	9/2$^+$			
		5964.7# *20*	84.0& *23*	2051.6	7/2$^+$			
		7564	8.7& *15*	450.70	5/2$^+$			
8062		8060.5[b]	100	0.0	3/2$^+$			
8163.1	5/2$^+$	6109.5‡ *18*	33& *3*	2051.6	7/2$^+$			
		7712 *2*	30.3& *21*	450.70	5/2$^+$			
		8162 *2*	100& *3*	0.0	3/2$^+$			
8288		5573[b]	100	2714.5	9/2$^+$			
8342		7888[b]	100	450.70	5/2$^+$			
8941.6		1794†		7145.2	(13/2$^+$)			
		2745†		6194.7	(13/2$^+$)			E_γ: Other: 2752 (^{12}C,nγ).
9596.7	(15/2$^+$,17/2$^+$)	2451†		7145.2	(13/2$^+$)			
		3402†		6194.7	(13/2$^+$)			E_γ: Other: 3417 (^{12}C,nγ).

$^{23}_{12}Mg_{11}$-9

Adopted Levels, Gammas (continued)

$\gamma(^{23}Mg)$ (continued)

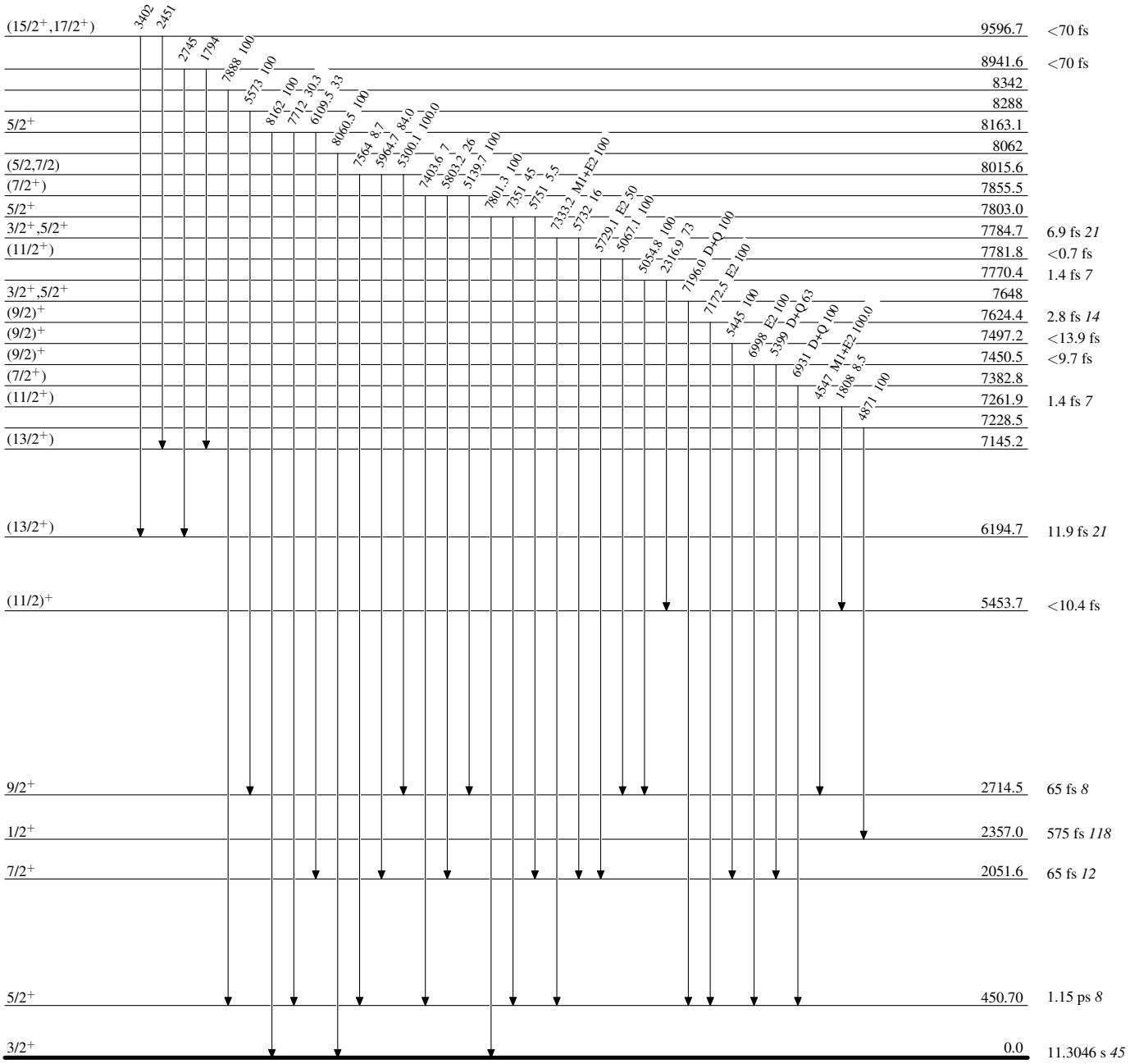
† From ($^{16}O,\alpha n\gamma$).
‡ From ($^{12}C,n\gamma$).
# Weighted average of data from ($^{12}C,n\gamma$) and (p,γ).
@ From ($^{3}He,\alpha\gamma$).
& From (p,γ).
a From ^{23}Al ε decay.
b Deduced from level-energy differences, corrected for recoil, except otherwise noted.
c From ($^{12}C,n\gamma$), except otherwise noted.
d From ($^{3}He,\alpha\gamma$), except where otherwise noted and RUL.
e From ($^{3}He,\alpha\gamma$).
f Additional information 4.

$^{23}_{12}Mg_{11}$-10

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

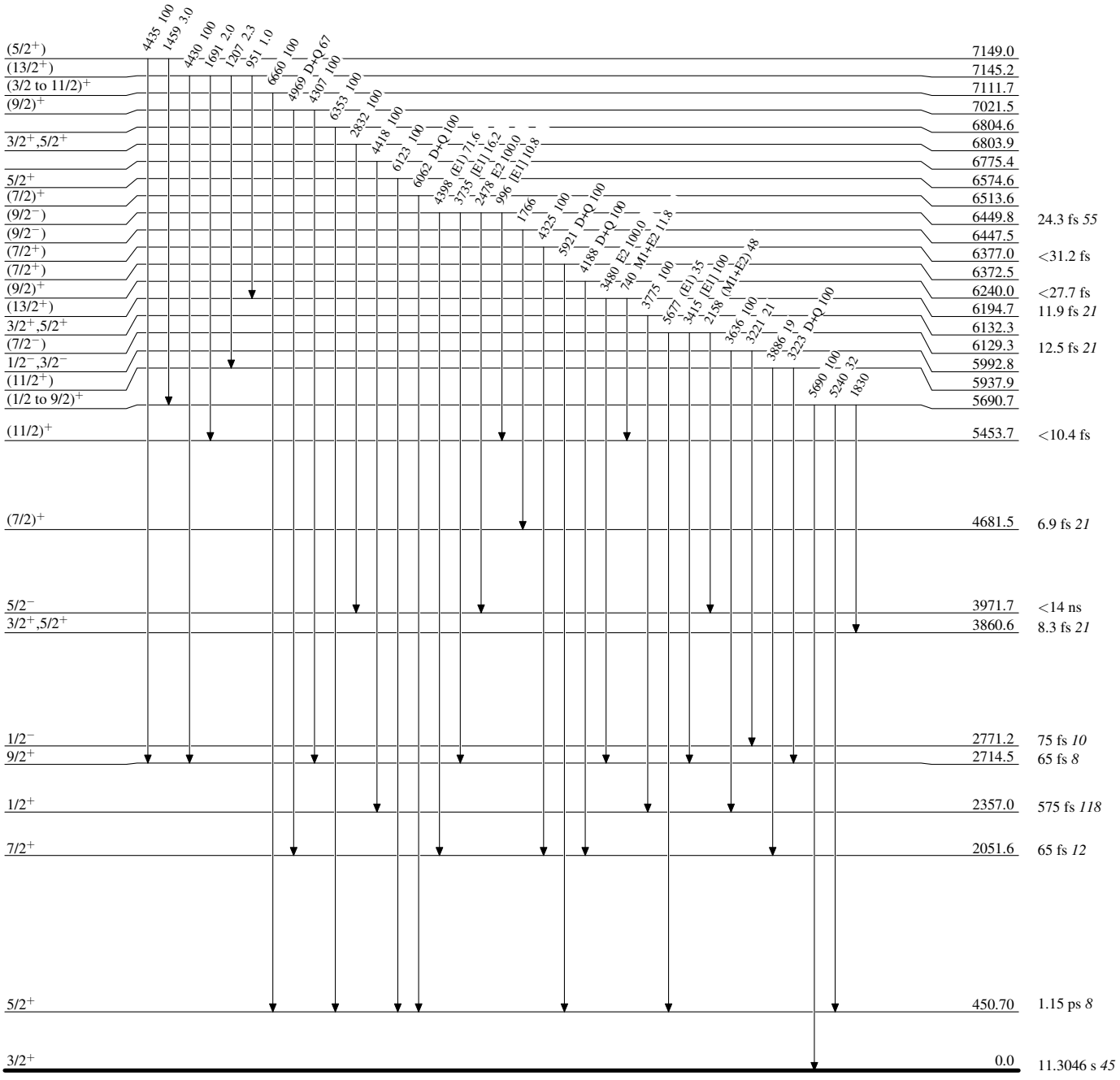


$^{23}_{12}Mg_{11}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

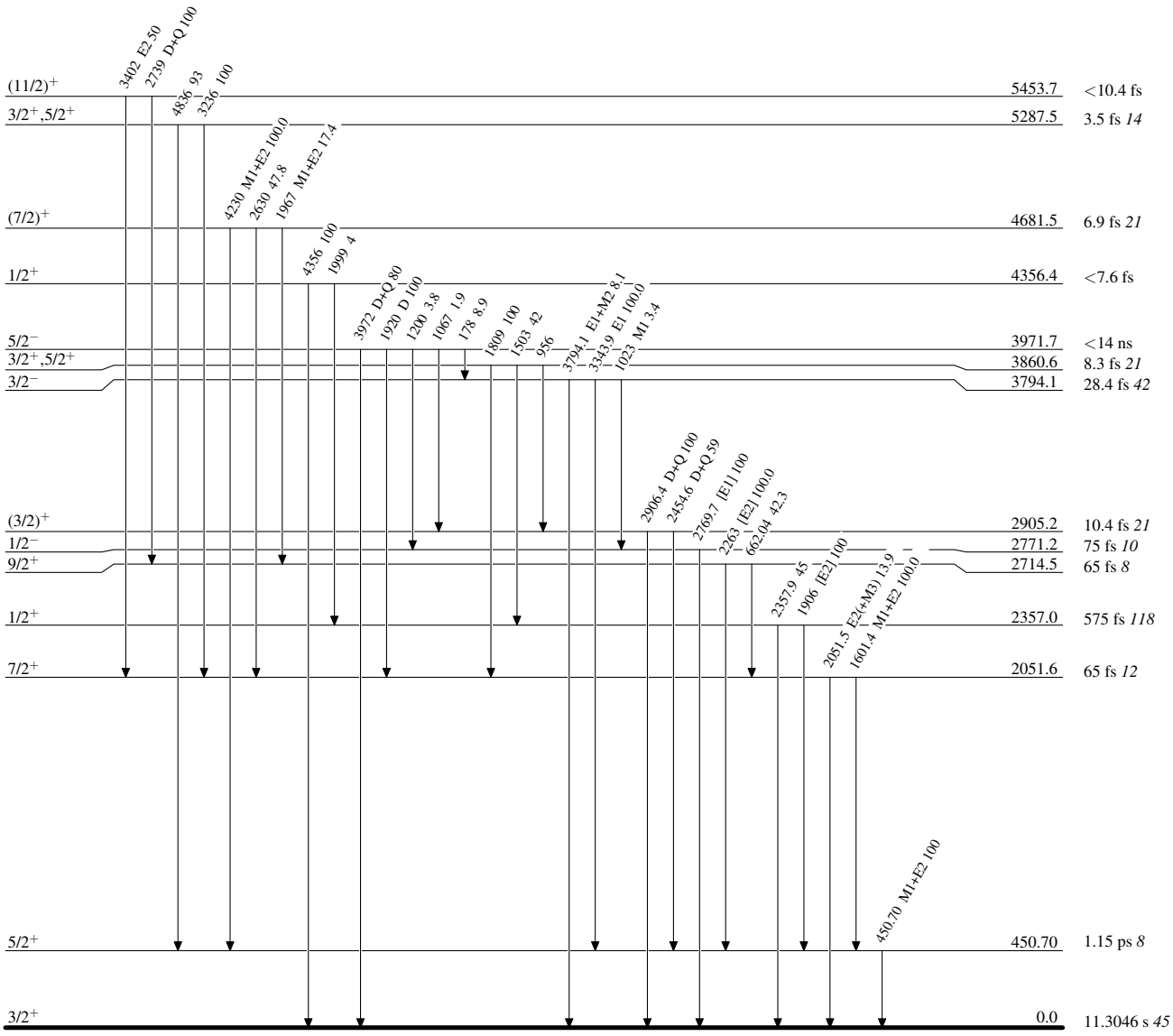


$^{23}_{12}Mg_{11}$

Adopted Levels, Gammas

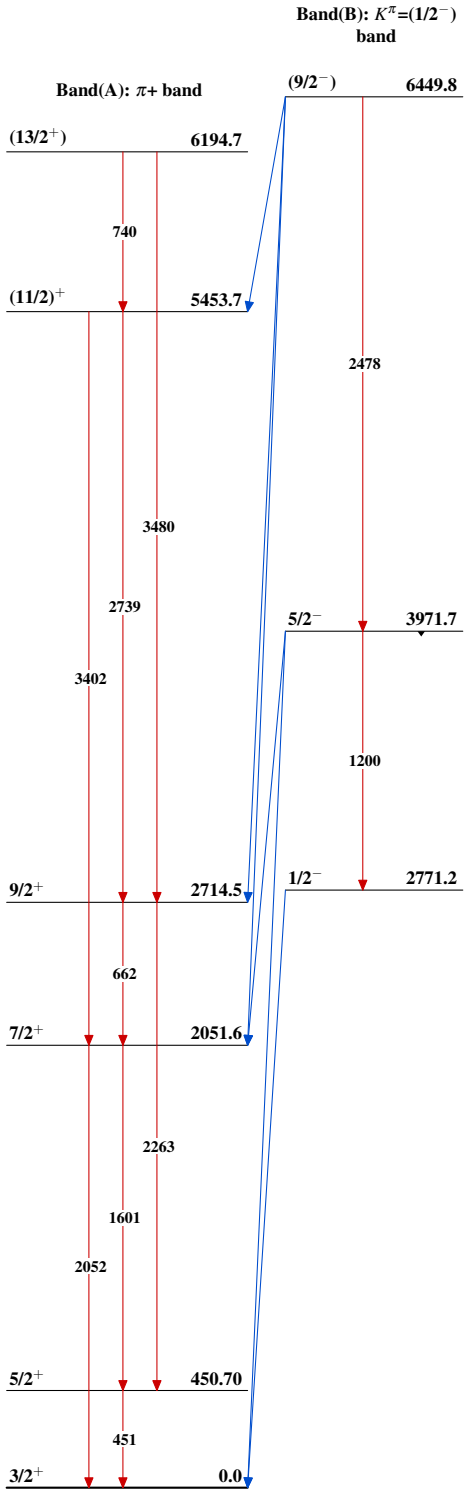
Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{23}_{12}Mg_{11}$

Adopted Levels, Gammas



$^{23}_{12}Mg_{11}$